

Navajo Abandoned Uranium Mine

Site Screen Report

This form is for use at the site of abandoned uranium mines (AUM) located on Navajo Nation lands. Applicable sites include all mine and mine features that have or have not undergone reclamation by the Navajo Abandoned Mine Lands Reclamation Program, including features, adits, pits and waste piles. Applicable sites also include all AUM sites listed in the USEPA CERCLIS database, all sites listed in the 2008 AUM GIS Report issued by USACOE and USEPA, all AUM sites on allotment lands associated with the Navajo Nation, and any and all AUM sites not listed in any database located on Navajo lands. Reconnaissance of any sites located on lands adjacent to Navajo lands that may be impacting Navajo lands will need to be coordinated with the authorities appropriate to those lands.

The purpose of the form is to ascertain the status and location of the identified AUM site, and record all immediate site information associated with the mine site. Decisions and recommendations on what additional steps are needed will be provided on a separate document.

Section 9 Lease AUM Site

*This screening report has been revised to remove the indication that Site ID# 457 contained structures associated with a former processing mill. The structures at the site appeared similar to mill structures during the initial site screening. After further examination, the structures at the site may have likely been associated with mining activities and operations other than that of a processing mill. Please Contact USEPA for further explanation.

Navajo AUM Western Region

Prepared by:

Weston Solutions, Inc.

Contract: W91238-06-F-0083

12767.063.599.1111

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Part I Site Identification, Location and Status

Site Names and ID numbers as applicable

Mine ID: 457; 458; 459

Map ID: 457: W92; 458: W98; 459: W99

CERCLIS: NNN000909110

Navajo Abandoned Mine Land Reclamation Program: None

Local name / Aliases: Section 9; Upgrader Property; C. O. Bar Livestock Company; mitone 1; mitone No. 1

Chapter and local area: State of Arizona

County: Coconino **State:** Arizona

Lat/Long: 457: 35.7397361971 N / -111.324146661 W
458: 35.7304249432 N / -111.330390516 W
459: 35.7261848105 N / -111.327493692 W

Nearby road and highway: Highway 89 **Local Post Office:** Cameron, AZ

Surface Land Status: check one or more and provide ownership and contact information below

Tribal Trust Land	<input type="checkbox"/>	Public lands	<input type="checkbox"/>
Private	<input type="checkbox"/>	Tribal Fee Land	<input type="checkbox"/>
Bureau of Land Mgmt	<input type="checkbox"/>	Allotment	<input type="checkbox"/>
State	<input checked="" type="checkbox"/>	Fee land	<input type="checkbox"/>

Subsurface Mineral Rights:

No information on subsurface mineral rights ownership was found in the EPA/AUM Database.

Claim and operator information:

The Section 9 Lease mine claim consists of 3 separate mine sites (#'s 457, 458, 459). The mine claim surface land status is classified as State of Arizona land. Historical documents showed the operator of the mine as the Rare Metals Corporation in 1957, C.L. Rankin from 1958 to 1959, and Murchison Ventures from 1959 to 1960. No additional ownership / lease information was identified in the EPA/AUM database.

Number of residential structures within 200 feet of mine: None

Estimated volume of mine waste onsite: 457: 46,296 yd³; 458: 8,333 yd³; 459: 249 yd³

Part II Summary of radiological readings

Mine ID: 457

Highest gamma radiation measurement:

999,960 counts per minute (cpm)

Describe any other radiological measurements:

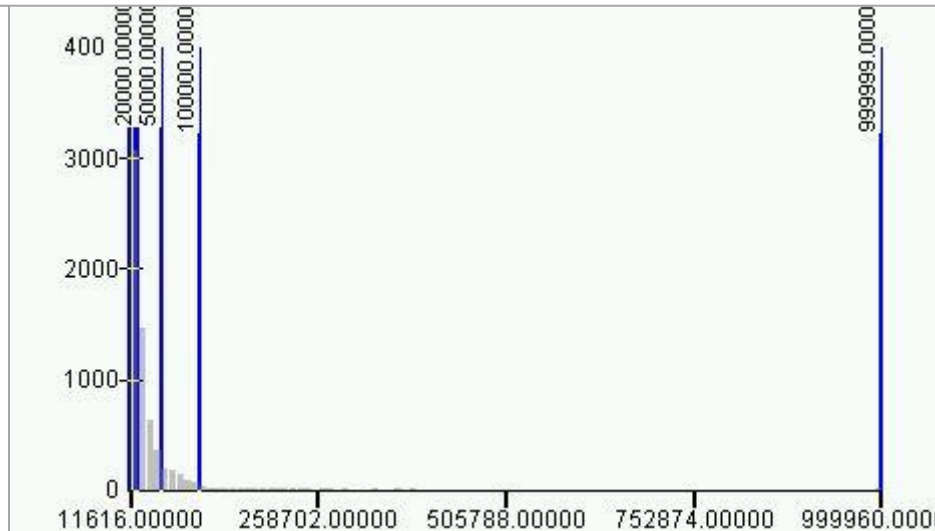
A total of 6,717 gamma radiation measurements were collected from the mine site, ranging from 11,616 cpm to 999,960 cpm. The measurements collected throughout the concrete structure foundation area were found at levels ranging from approximately 50,000 cpm (bare cement foundation) to 1,000,000 cpm (small dirt piles atop foundation), at the waste piles throughout the site at levels ranging from approximately 40,000 cpm to 1,000,000 cpm, and at the former pond area and downstream drainage at maximum levels of approximately 100,000 cpm. The measurements are represented in Figures 1, 2, 3, and 4.

Background Readings: 15,843 cpm; 15,455 cpm

Background Average: 15,649 cpm (mine claim background average was 15,626 cpm)

Distribution Chart and Statistics:

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	6717
Minimum:	11616.00000
Maximum:	999960.00000
Sum:	332315799.00000
Mean:	49473.84234
Median:	22558.00000
Standard Deviation:	92138.62204

Mine ID: 458

Highest gamma radiation measurement:

968,863 counts per minute (cpm)

Describe any other radiological measurements:

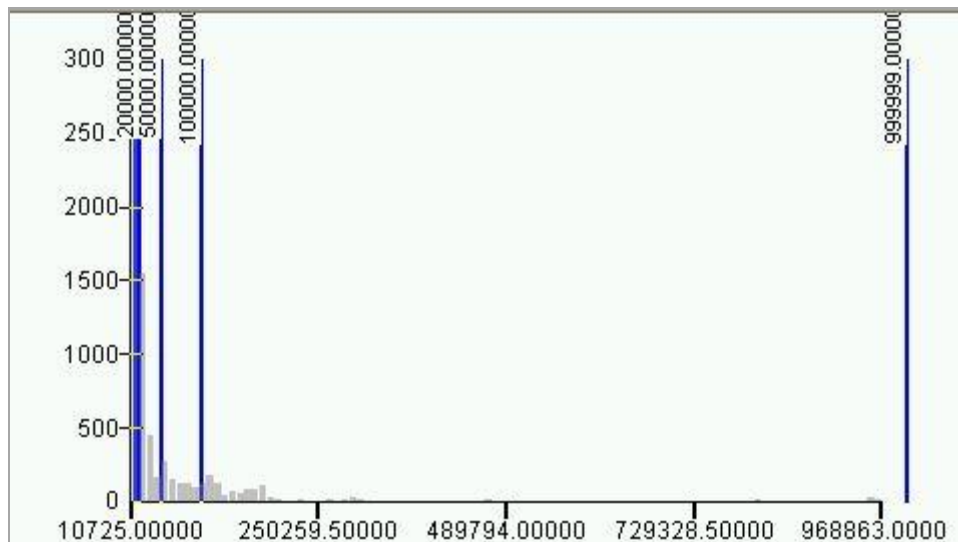
A total of 7,037 gamma radiation measurements were collected from the mine site, ranging from 10,725 cpm to 968,863 cpm. The measurements collected along the edge of the waste rock area were found at a maximum level of approximately 150,000 cpm, in the center of the waste rock area at a maximum level of approximately 1,000,000 cpm, and at possible pit area at a maximum level of approximately 300,000 cpm. The measurements are represented in Figures 1, 2, 5, and 6.

Background Readings: 15,455 cpm

Background Average: 15,455 cpm (mine claim background average was 15,626 cpm)

Distribution Chart and Statistics:

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	7037
Minimum:	10725.00000
Maximum:	968863.00000
Sum:	414257471.00000
Mean:	58868.47677
Median:	22469.00000
Standard Deviation:	105611.70106

Mine ID: 459

Highest gamma radiation measurement:

879,666 counts per minute (cpm)

Describe any other radiological measurements:

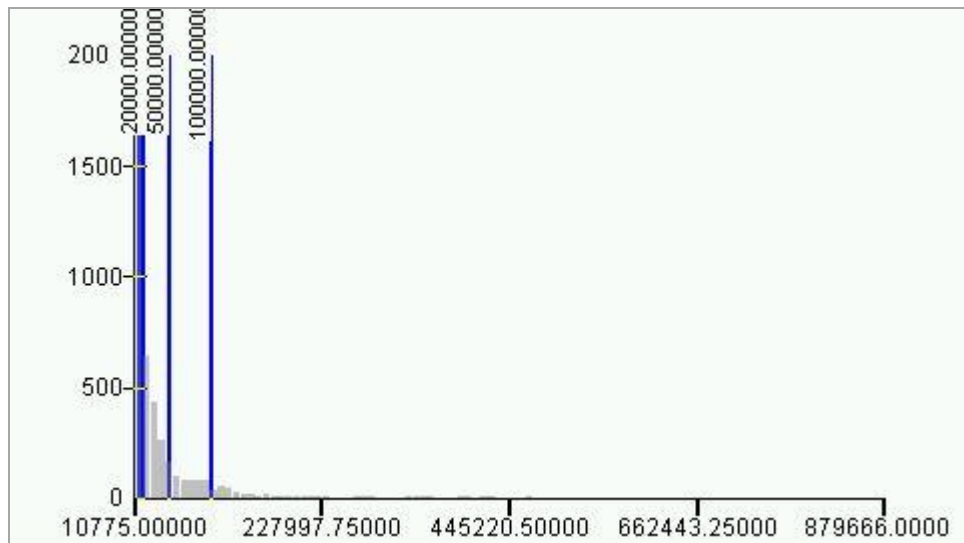
A total of 4,040 gamma radiation measurements were collected from the mine site, ranging from 10,775 cpm to 879,666 cpm. The measurements collected from the waste rock area were found at maximum levels ranging from approximately 60,000 cpm to 875,000 cpm, in the pit area ranging from approximately 30,000 cpm and the top to approximately 100,000 cpm at the bottom. The measurements are represented in Figures 1, 2, 7, and 8.

Background Readings: 15,775 cpm

Background Average: 15,775 cpm (mine claim background average was 15,626 cpm)

Distribution Chart and Statistics:

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	4040
Minimum:	10775.00000
Maximum:	879666.00000
Sum:	207376058.00000
Mean:	51330.70743
Median:	22562.00000
Standard Deviation:	80056.99470

Part III Status of Reclamation and Mine Waste

Mine ID: 457

The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:

NAMLRP Status of the mine site: Reclaimed : Unknown **Waste Pile onsite :** No

NAMLRP Project Number: None

NAMLRP Mine features: None

The following information was obtained from field observations collected during the 2010 site screening:

Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.

Observed reclamation work and status:

Adits

None

Waste Piles

Waste piles spread throughout entire central part of site, primarily surrounding the concrete structure foundation, total estimated size of 1,000' x 250' x 5'

Pits

None

Shafts

None

Other Debris and Mine Features

A concrete foundation and 2 walls from a former structure were found in the center of the site, the foundation was spread out between 2 levels, covering an estimated area of 100' x 50'. Two of the walls were still partially intact. The lower wall is approximately 30' high. Two chutes are still visible leading between the levels. A smaller 20' x 20' foundation was found approximately 300' south of large foundation. Other various metal and wood debris was found throughout site.

Mine ID: 458

The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:

NAMLRP Status of the mine site: Reclaimed : Unknown **Waste Pile onsite :** No

NAMLRP Project Number: None

NAMLRP Mine features: None

The following information was obtained from field observations collected during the 2010 site screening:

Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.

Observed reclamation work and status:

Adits

None

Waste Piles

Majority of site is a large waste pile, extends S past the site boundaries, estimated size of 750' x 300' x 5'

Pits

None

Shafts

None

Other Debris and Mine Features

Mining debris spread out (drill rods); possible pit area in center of waste area

Mine ID: 459

The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:

NAMLRP Status of the mine site: Reclaimed : Yes

Waste Pile onsite : No

NAMLRP Project Number: NA-0155A

NAMLRP Mine features: 1 Rim Strip / Pit

The following information was obtained from field observations collected during the 2010 site screening:

Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.

Observed reclamation work and status:

Adits

None

Waste Piles

7 Waste piles: 2 small piles 6' x 4' x 2.5', yellow-brown upstream of N gully; 1 medium pile, 10' x 8' x 4', yellow brown upstream of N gully; 4 large piles, 20' diameter x 15' h, yellow brown, near open pit

Pits

Open Pit 60' x 80' x 15' depth, sandy bottom with vegetation

Shafts

None

Other Debris and Mine Features

None

Part IV

Site observations and Environs

Observed Structures: list number of and describe human habitation status of structures at the following distances from mine:

0 to 200 feet: None

200 feet to 0.25 mile: None

Observed Public or commercial structure: list and describe all schools, clinics, Chapter Houses, places of business and any other structure used by members of the community at the following distances:

0 to 200 feet: A large concrete foundation and 2 intact walls from a large structure were found in the center of site 457

200 feet to 0.25 mile: None

Levels measured around the perimeter(s) of the identified structure(s):

Waste piles atop the foundation area were found at levels up to 1,000,000 cpm

Observed water sources: list the number and type of wells and surface water sources that are potentially used for human consumption at the following distances from the mine:

0 to 0.25 miles: Little Colorado River Basin runs through the eastern edge of site 457

0.25 miles to 4 miles: None

Sensitive environments: note and describe all sensitive environments located within visible range of the mine site, including: wetlands, endangered species, habitats and approximate locations of sites that may be under protection of the government of the Navajo Nation.

Little Colorado River Basin adjacent to site 457, possible wetlands

Known Site History: include information from interviews with Chapter officials and residents. Note information on mine ownership, type of mining operation, period of operation, known amount of production, and any other information as provided.

Section 9 Lease mine claim consists of 3 separate mine sites (#'s 457, 458, 459) with a total combined area of 158,706.71 m². The mine claim was identified as being operational from 1957 to 1960. Historical documents showed the operator of the mine as the Rare Metals Corporation in 1957, C.L. Rankin from 1958 to 1959, and Murchison Ventures from 1959 to 1960. While operational, the mine had a total production volume of 362 tons. No other historical information or any additional ownership / lease information was identified in the EPA/AUM database.

Part V Response Action Summary

Summary of Evaluation Factors:

Accessibility:

Was the mine easily accessible to potential human activity?

Yes

Radiological Measurements:

Were any gamma radiation measurements collected at the mine greater than two times the site-specific background levels?

Yes

Waste Piles:

Were any unreclaimed waste piles observed at the mine with gamma radiation measurements greater than two times the site-specific background levels?

Yes

Structures:

Were any structures observed within 200 feet of the mine?

Yes

Potential Drinking Water Sources:

Were any potential drinking water sources observed within 4 miles of the mine?

Yes

Reclamation:

Was the mine reported to be previously reclaimed, or did the mine appear to be reclaimed?

No

Part VI Photos



Photo 1. Section 9 Lease, Site #457, western boundary



Photo 2. Section 9 Lease, Site #457, waste pile



Photo 3. Section 9 Lease, Site #457, waste piles



Photo 4. Section 9 Lease, Site #457, concrete structure area



Photo 5. Section 9 Lease, Site #457, concrete structure area



Photo 6. Section 9 Lease, Site #457, concrete structure area



Photo 7. Section 9 Lease, Site #457, concrete structure area



Photo 8. Section 9 Lease, Site #457, concrete structure area waste pile



Photo 9. Section 9 Lease, Site #457, concrete structure area



Photo 10. Section 9 Lease, Site #457, concrete structure area



Photo 11. Section 9 Lease, Site #457, concrete structure area



Photo 12. Section 9 Lease, Site #457, concrete structure area waste pile, gamma readings approximately 1,000,000 cpm



Photo 13. Section 9 Lease, Site #457, concrete structure area



Photo 14. Section 9 Lease, Site #457, concrete structure area



Photo 15. Section 9 Lease, Site #457, concrete structure area



Photo 16. Section 9 Lease, Site #457, former pond area



Photo 17. Section 9 Lease, Site #457, former pond area



Photo 18. Section 9 Lease, Site #457, Little Colorado River basin, eastern boundary



Photo 19. Section 9 Lease, Site #457, Little Colorado River basin, eastern boundary



Photo 20. Section 9 Lease, Site #457, foundation south of concrete structure area



Photo 21. Section 9 Lease, Site #457, debris



Photo 22. Section 9 Lease, Site #457, debris



Photo 23. Section 9 Lease, Site #457, debris



Photo 24. Section 9 Lease, Site #457, road leading to western boundary



Photo 25. Section 9 Lease, Site #458



Photo 26. Section 9 Lease, Site #458, waste pile



Photo 27. Section 9 Lease, Site #458, waste piles



Photo 28. Section 9 Lease, Site #458, waste piles



Photo 29. Section 9 Lease, Site #458, waste piles



Photo 30. Section 9 Lease, Site #458, waste pile, gamma readings approximately 1,000,000 cpm



Photo 31. Section 9 Lease, Site #458, center of waste area and possible pit



Photo 32. Section 9 Lease, Site #458, center of waste area and possible pit



Photo 33. Section 9 Lease, Site #458, mining evidence



Photo 34. Section 9 Lease, Site #459, waste piles



Photo 35. Section 9 Lease, Site #459, waste piles



Photo 36. Section 9 Lease, Site #459



Photo 37. Section 9 Lease, Site #459, waste piles



Photo 38. Section 9 Lease, Site #459, possible pit area with waste piles



Photo 39. Section 9 Lease, Site #459

Part VII Contacts Reports and Information

Name: Stanley Edison (928) 871-6861

Eugene Esplain (928) 871-7331

Title or official role (if any) Navajo EPA Superfund Program

Address PO Box 2946, Window Rock, AZ 86515

Information provided Lead Regulatory Agency

Name _____

Title or official role (if any) _____

Address _____

Telephone number _____

Information provided _____

Name _____

Title or official role (if any) _____

Telephone number _____

Information provided _____

Name _____

Title or official role (if any) _____

Telephone number _____

Information provided _____



**Figure 1 - Gamma Radiation Measurements, Above Two Times Background
Section 9 Lease (457, 458, 459)
Coconino County, Arizona**

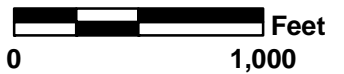


Legend

Gamma Radiation Measurements

- < 2X Background
- > 2X Background

- General Slope Direction
-  Observed Waste Pile
-  Mine Site Boundary

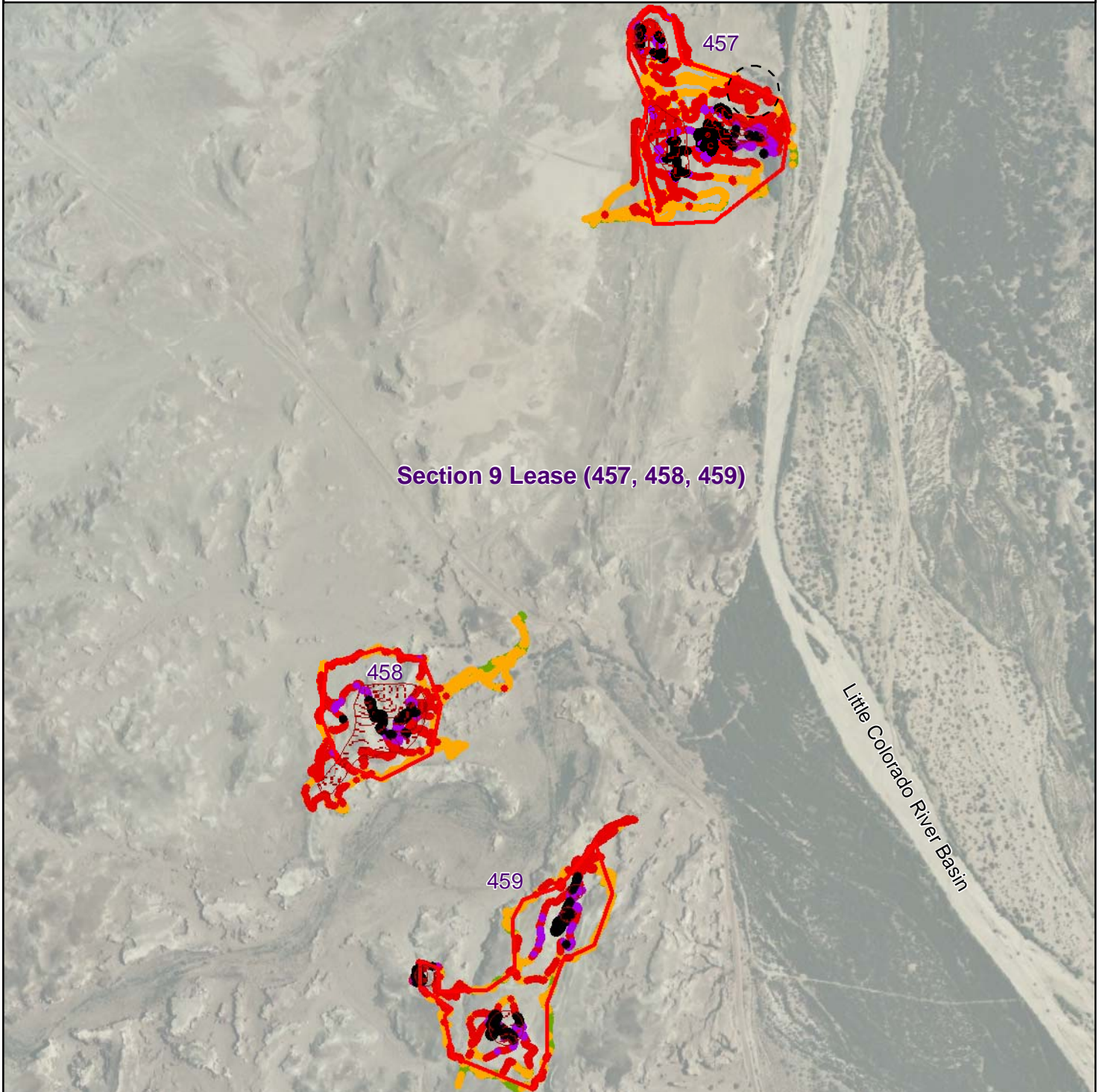


Gamma survey conducted 11/2010
Measured as counts per minute (cpm)

Average background 15,626 cpm



**Figure 2 - Gamma Radiation Measurements
Section 9 Lease (457, 458, 459)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

Average background 15,626 cpm

→ General Slope Direction

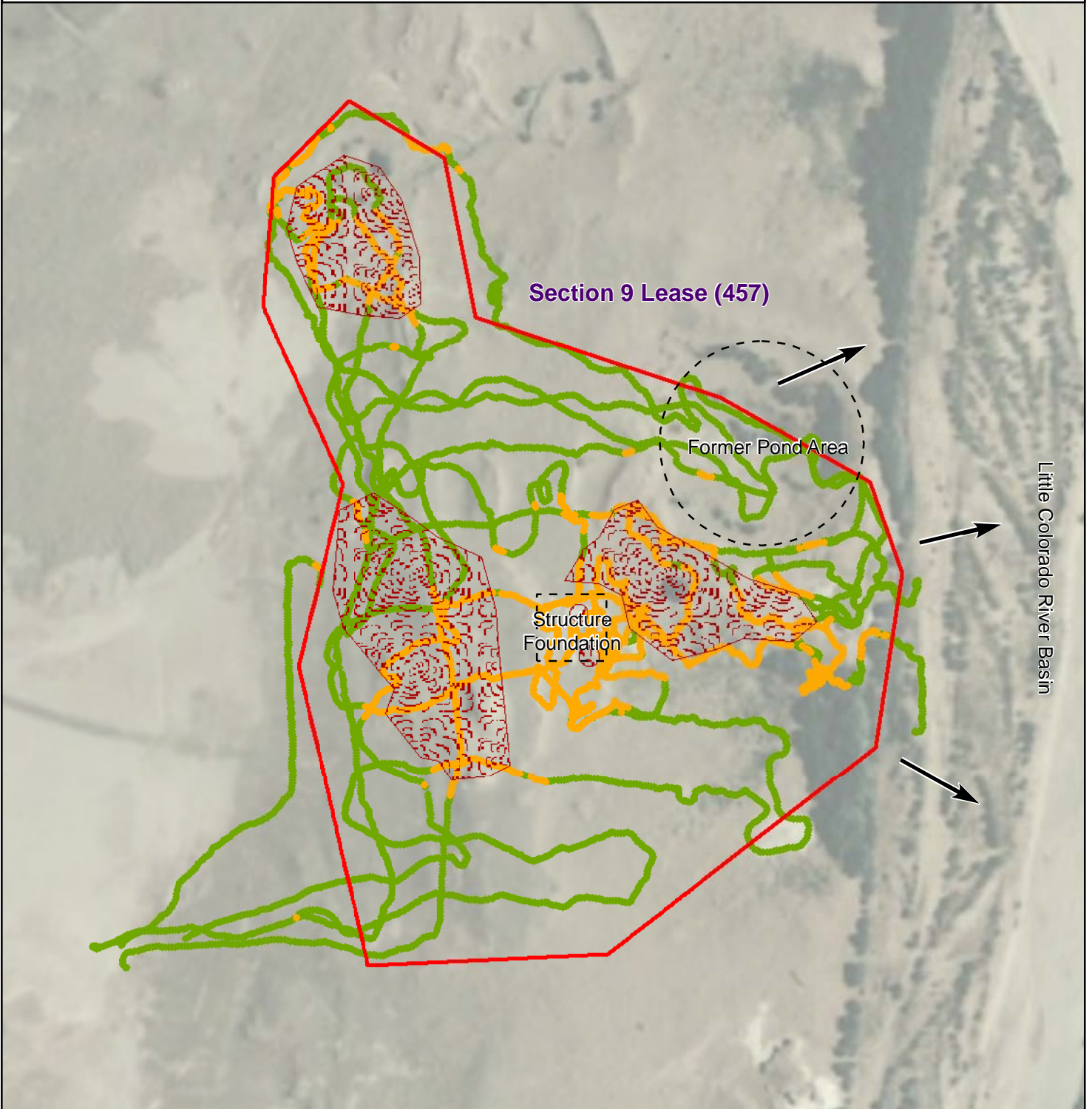
▭ Observed Waste Pile

▭ Mine Site Boundary



Gamma survey conducted 11/2010
Measured as counts per minute (cpm)

**Figure 3 - Gamma Radiation Measurements, Above Two Times Background
Section 9 Lease (457)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

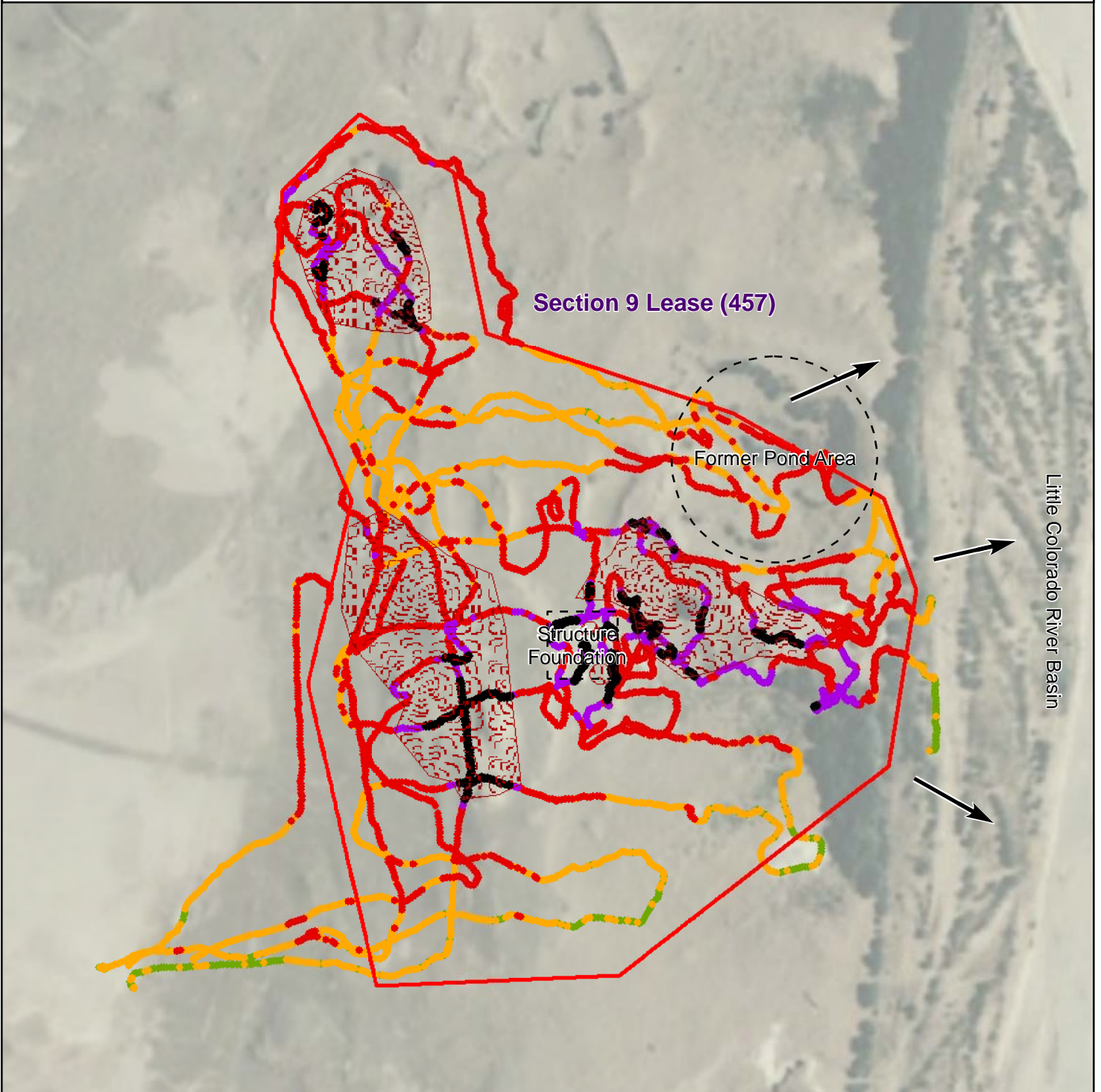
- < 2X Background
- > 2X Background

- General Slope Direction
- Observed Waste Pile
- Mine Site Boundary

Gamma survey conducted 11/2010
Measured as counts per minute (cpm)

Average background 15,626 cpm

**Figure 4 - Gamma Radiation Measurements
Section 9 Lease (457)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

Average background 15,626 cpm

➔ General Slope Direction

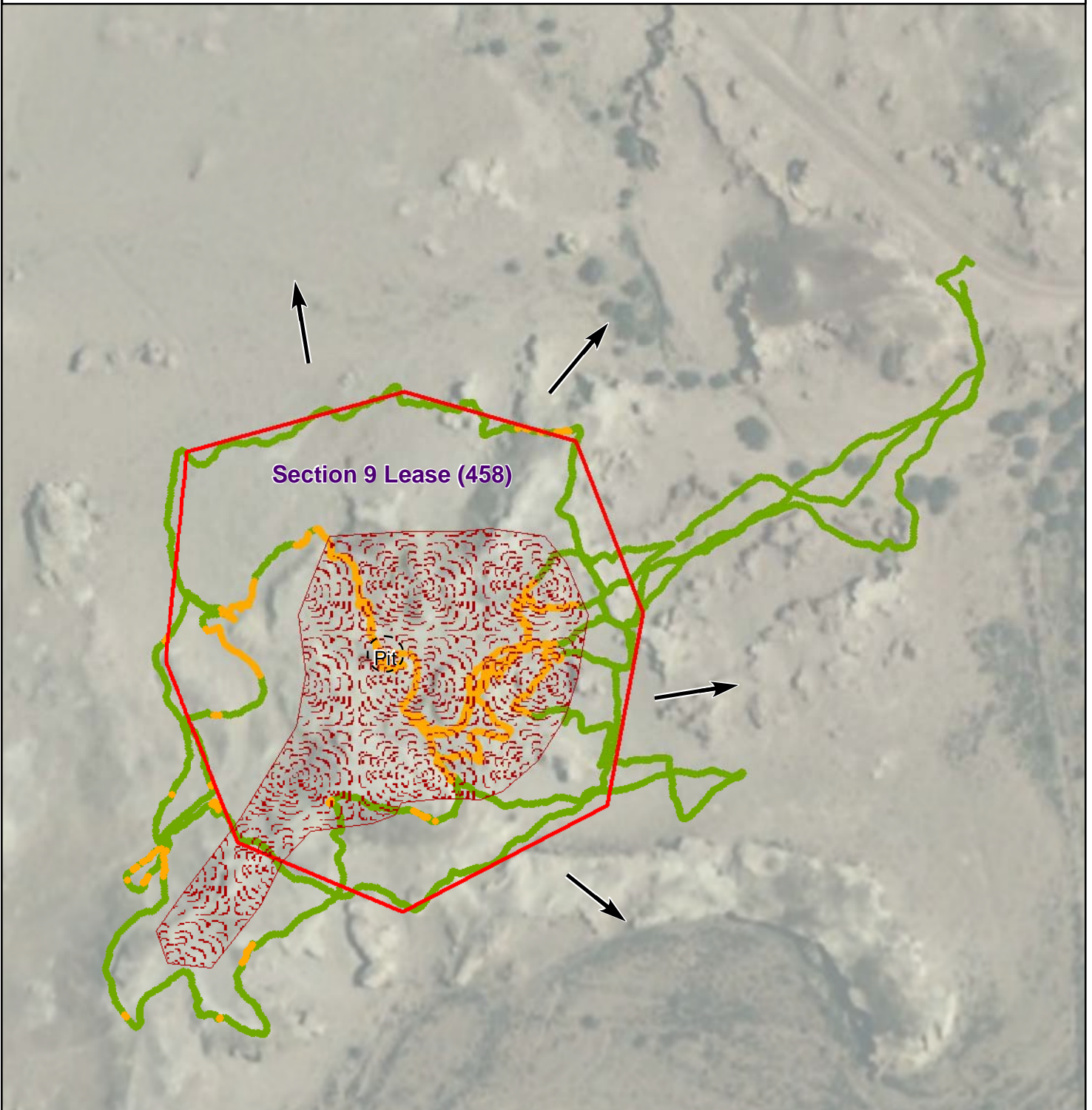
 Observed Waste Pile

 Mine Site Boundary

Gamma survey conducted 11/2010
Measured as counts per minute (cpm)





**Figure 5 - Gamma Radiation Measurements, Above Two Times Background
Section 9 Lease (458)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

- < 2X Background
- > 2X Background

- General Slope Direction
-  Observed Waste Pile
-  Mine Site Boundary

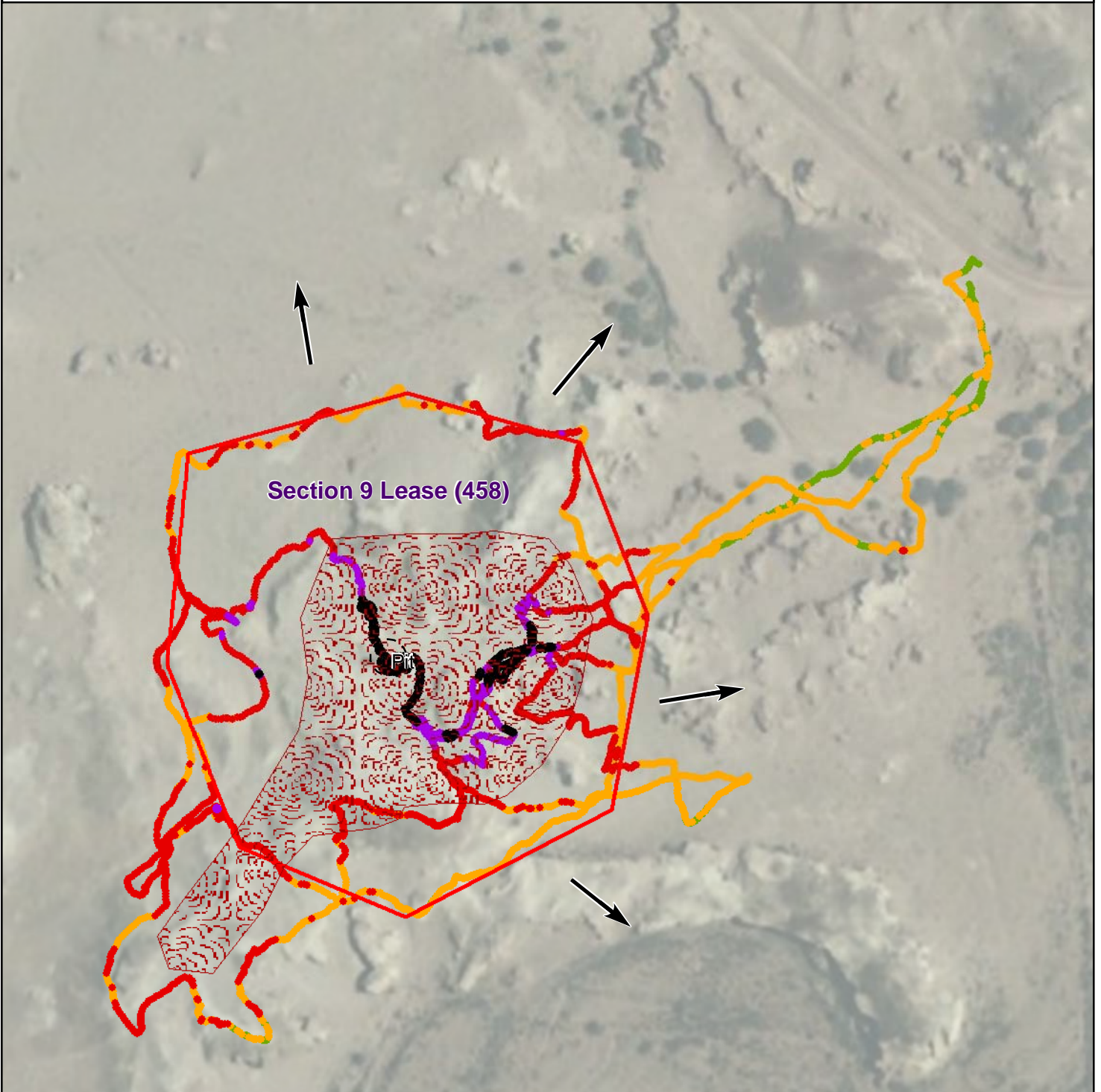
Gamma survey conducted 11/2010
Measured as counts per minute (cpm)

Average background 15,626 cpm






**Figure 6 - Gamma Radiation Measurements
Section 9 Lease (458)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

Average background 15,626 cpm

General Slope Direction

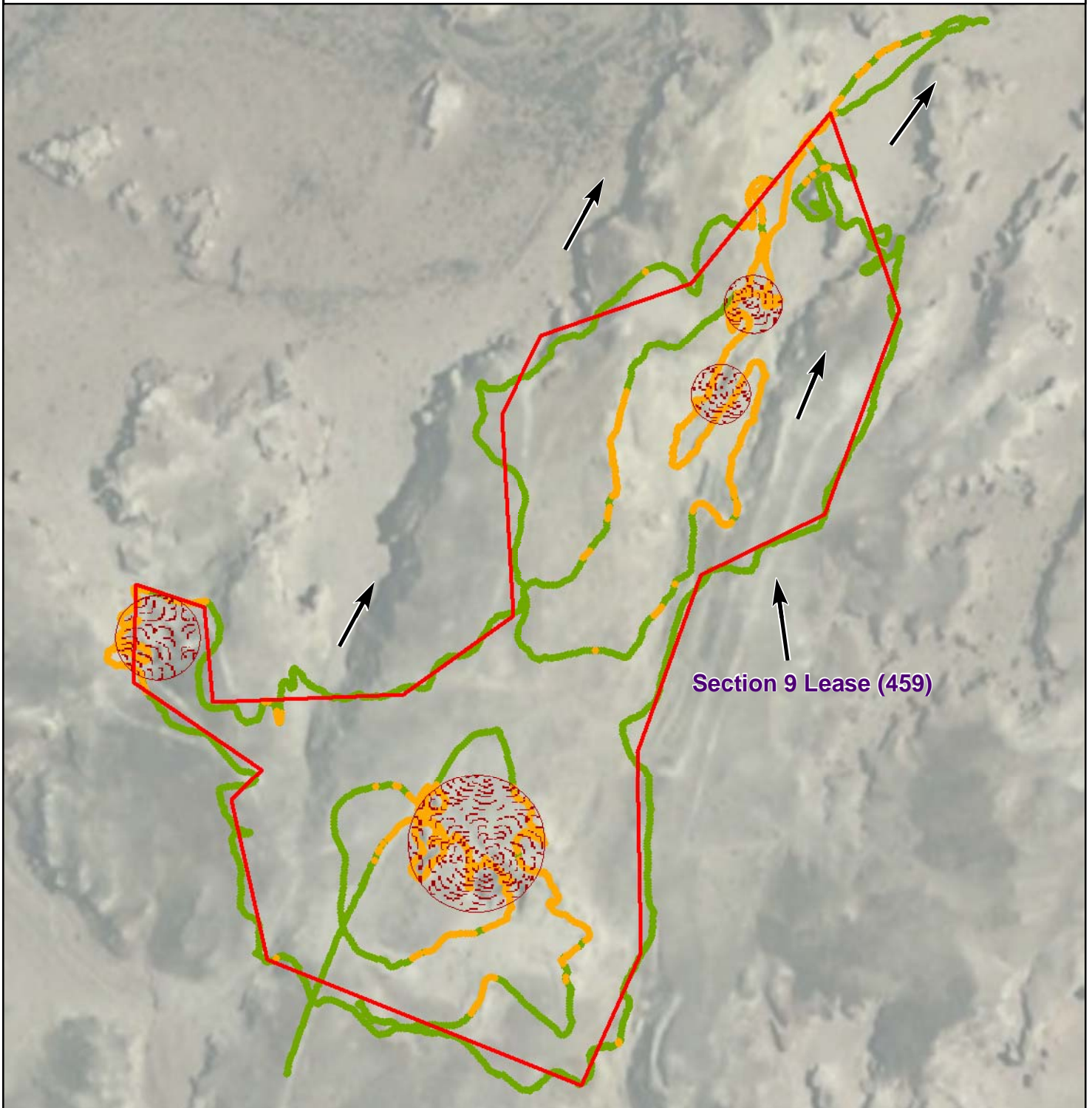
Observed Waste Pile

Mine Site Boundary



**Gamma survey conducted 11/2010
Measured as counts per minute (cpm)**



**Figure 7 - Gamma Radiation Measurements, Above Two Times Background
Section 9 Lease (459)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

- < 2X Background
- > 2X Background

- General Slope Direction
-  Observed Waste Pile
-  Mine Site Boundary

Gamma survey conducted 11/2010
Measured as counts per minute (cpm)

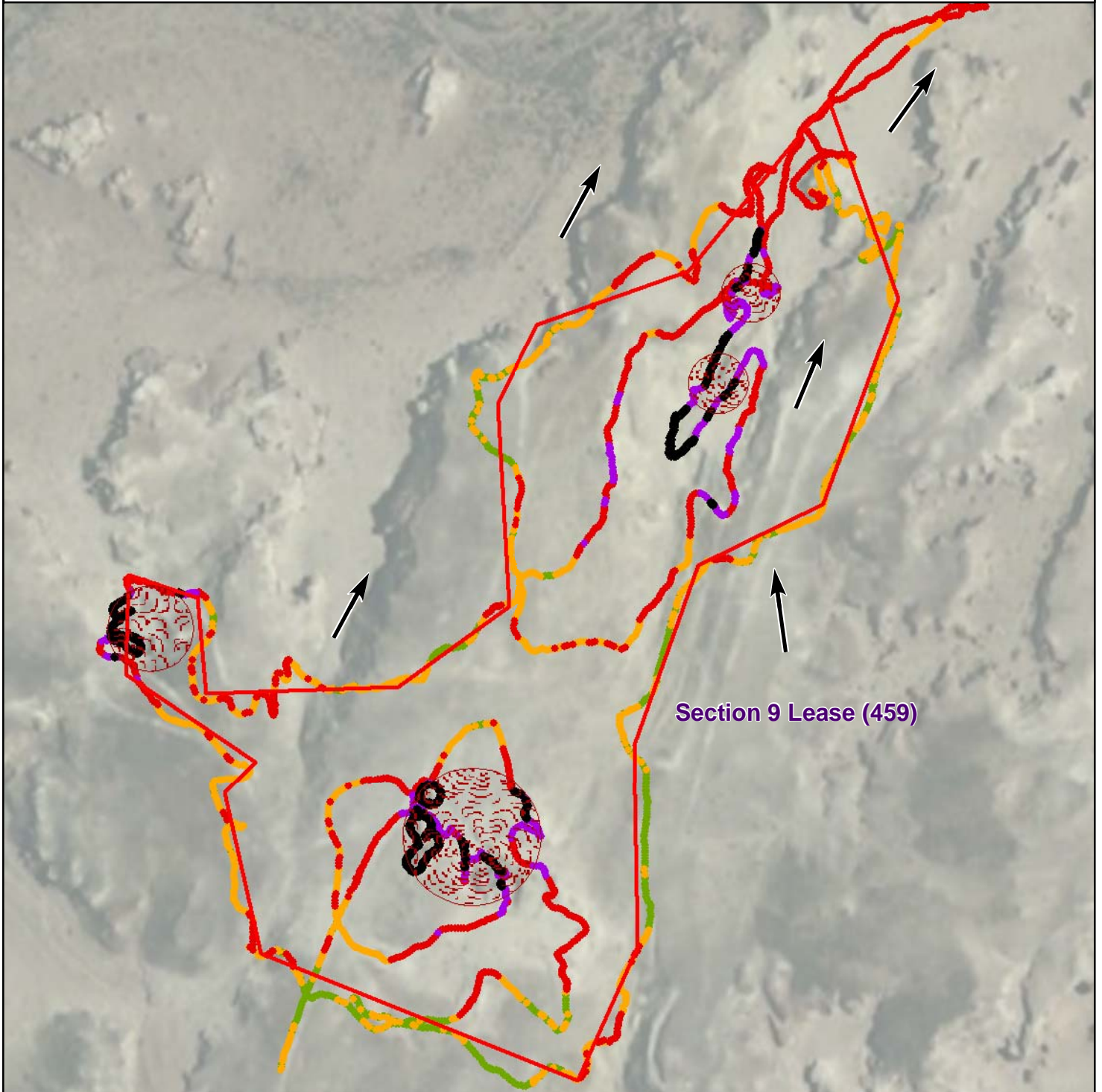
Average background 15,626 cpm








**Figure 8 - Gamma Radiation Measurements
Section 9 Lease (459)
Coconino County, Arizona**



Legend

Gamma Radiation Measurements

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

Average background 15,626 cpm

→ General Slope Direction

 Observed Waste Pile

 Mine Site Boundary



Gamma survey conducted 11/2010
Measured as counts per minute (cpm)