STATUS AND VISION OF THE NYE COUNTY COMMUNITY- BASED GROUND WATER MONITORING PROGRAM

John Klenke

July 21, 2015

Overview

- Introduction
- Background
  - Nye County - responsibilities
  - Population
- Groundwater flow
- CEMP
- Vision and process
- Determining sample locations
- Reporting of results
- Education
- Conclusions

Introduction

- Nye County encompasses 18,199 mi^2
  - Largest county (by area) in the state, and the third-largest in contiguous US.
- NNSS (formerly the NTS) is entirely within Nye County
- Approximately 4410 mi^2 of federally controlled land
  - NNSS 1360 mi^2
  - NTTR estimated 2850 mi^2 in Nye County
- Population of 43,946 (2010 census)
- The remaining, approximately 13,790 square miles, needs to be addressed by a comprehensive water monitoring program.

Background

- Nye County has the duty to protect the health and safety of citizens
  - Includes environmental concerns

- **Nye County Water District (NCWD)**
  - Formed in 2009
  - "*Provide, protect and preserve water resources in Nye County.*"

Population

Pahrump:

- Approximately 26 miles south (downgradient) from NNSS
- Population of 38,000 people (2012)
- Possible 495,000 people in the future (Pahrump Master Plan)

Armargosa:

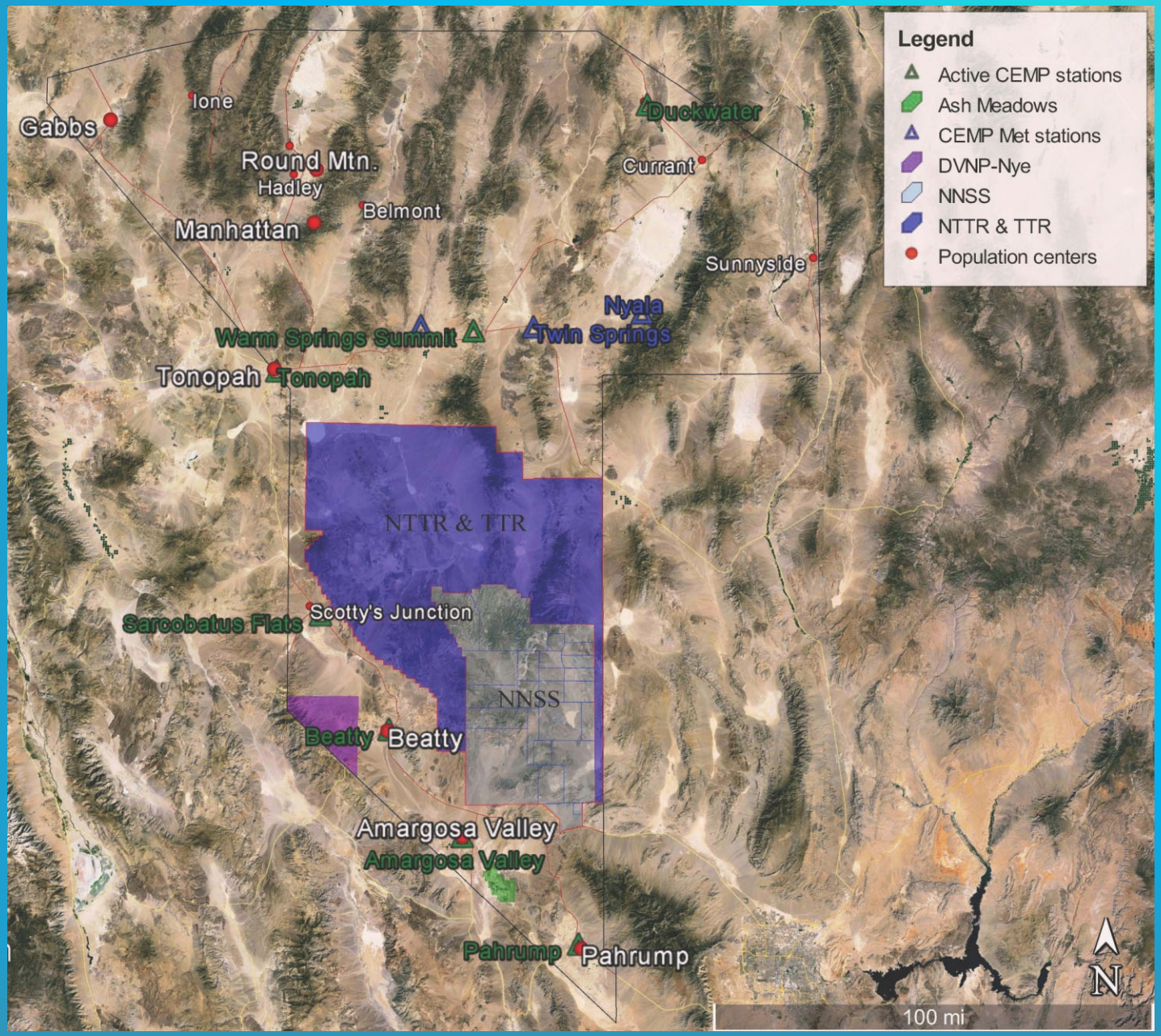
- Approximately 18 miles south (downgradient) from proposed High Level Nuclear Waster Repository (Yucca Mountain)
- Population of 1456 (2010 census)

Population - cont

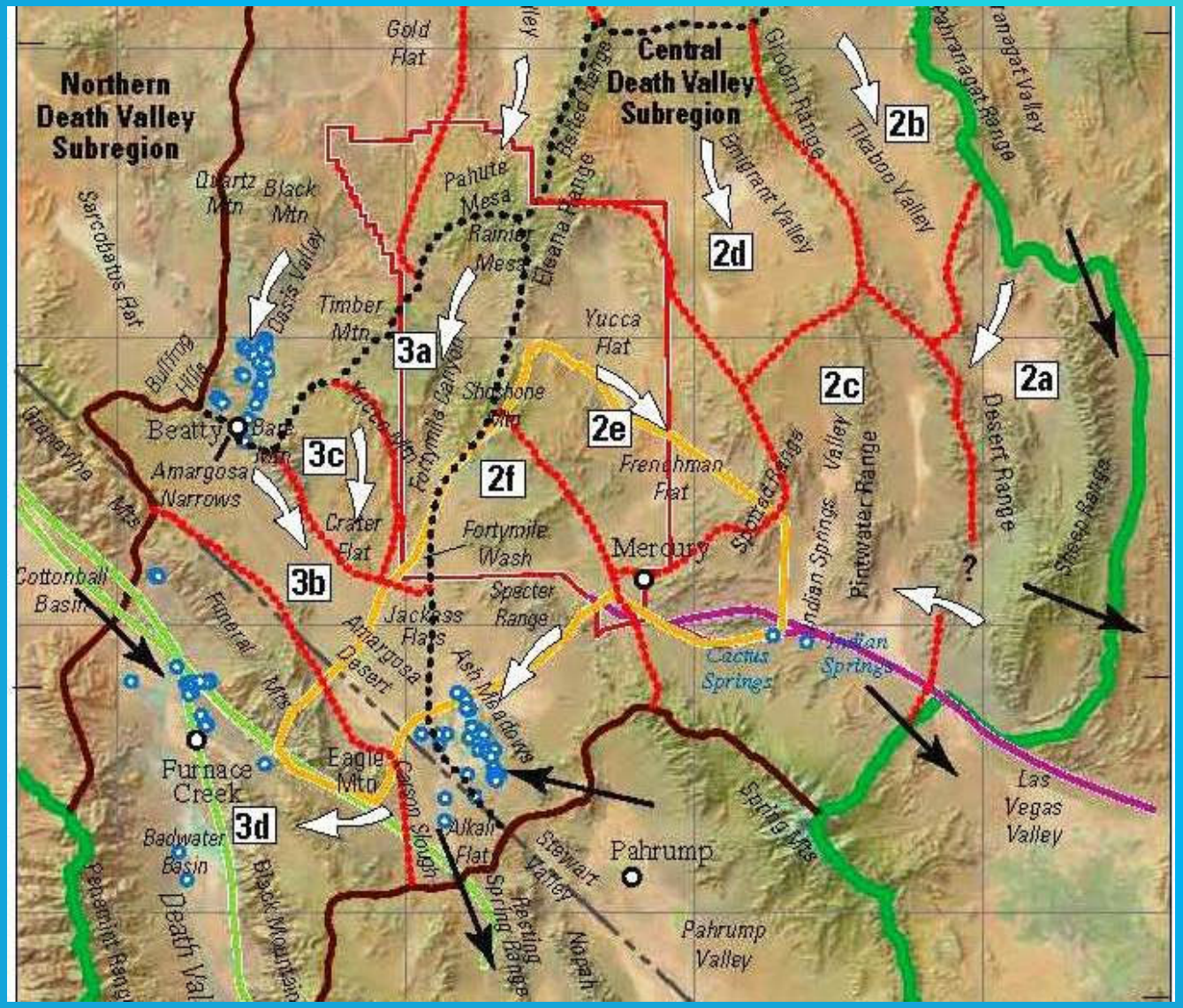
Beatty:

- Approximately 30 miles southwest (downgradient) from Pahute Mesa
- Approximately 25 miles southwest of ER-EC-11
  - Offsite well
  - Tritium detected 2009
  - 12,000 picocuries per liter (60% of EPA standard)
- Population of 1010 people (2010 census)

Population – cont



Groundwater Flow Direction



- Belcher 2010 - Death Valley Regional Groundwater Flow System

CEMP

Vision and Process

Determining Sample Locations

- Groundwater gradient (flow directions).
- Geology/Hydrology
  - Faults
  - Rock/Soil types
- Meetings with Community Environmental Monitors, DRI, and UGTA staff
  - Recommendations
  - Past sampling results
    - Tritium hits
    - Age of water
- Use results from above sources to locate candidate wells and springs
  - Availability/Access
  - Screened intervals
  - Casing type and diameter

Reporting of results

- Use existing CEMP forms of communication
- Links to results on Nye Co websites
  - nyecounty.net
  - nyecountywaterdistrict.net
- Fact sheets, brochures or handouts
- Press releases
- Local government awareness
- Public meetings and community events.
  - Include in NCWD information packets

Education and Awareness

- *How can we make people aware of the Community-Based Water Sampling and Testing Program ?*
- Local government education and engagement
- Local schools
  - Include information as part of the NCWD groundwater educational program
  - Requires NCWD Board Approval

Conclusions

- Data from the CEMP water sampling program will allow us to learn more about:
  - Quality of waters adjacent to and downgradient from the NNSS
  - Changes in water quality with time
  - XXXX
- CEMP water sampling and testing helps to protect the health and safety of the citizens and environment of Nye County
- Nye County would like to thank the Department of Energy (NNSA/NFO) and the Desert Research Institute for the opportunity to become affiliated with the CEMP

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM – 2016 UPDATE

Nye County Nuclear Waste Repository Project Office
John Klenke
July 30, 2016

Overview

- Background
- Land Status
- Population
- Responsibilities
- CEMP Stations and Focus Area
- Sampled Locations by DOE
- Determining Nye County Sample Locations
- 2015 Sampling Results
- Public Outreach
- Additional sampling locations
- Future Years
- Acknowledgement

Background – Why Are We Here?

- Nye County has the duty to protect the health and safety of citizens
- Through its Nuclear Waste Repository Project Office (NWRPO), Nye County conducted scientific characterization of the area between Yucca Mountain and the Town of Amargosa
  - Drilled and completed approximately 50 wells
  - Conducted numerous aquifer and tracer tests, geophysical surveys, water level measurements, and other specialized testing
  - Data provided to Department of Energy (DOE) for use in their repository characterization and safety analyses
- Tritium from former weapons tests has been observed moving, while still on government lands, offsite ; we will conduct expanded monitoring activities to supplement continued DRI monitoring at communities in the down-gradient areas
- Entered into a five-year grant with DOE to conduct water sampling and analysis at locations downgradient from areas formerly used for nuclear weapons testing

Land Status

- Nye County encompasses 18,199 mi^2
  - Largest county (by area) in the state, and the third-largest in contiguous US.
- Approximately 98% of land in Nye County is federally controlled
  - Bureau of Land Management
  - US Forest Service
  - Department of Defense
  - Department of Energy
- Nevada National Security Site (NNSS; formerly the Nevada Test Site) is entirely within Nye County; part of the Nevada Test and Training Range (NTTR) lies within Nye County
- Nye County population of 43,946 (2010 census)

Population

Pahrump:

- Approximately 26 miles south from NNSS
- Population of 38,000 people (2012)
- Possible 495,000 people in the future (Pahrump Master Plan)

Amargosa:

- Approximately 9 miles SW from the border of NNSS
- 50 miles south (downgradient) from Pahute Mesa
- Population of 1,456 (2010 census)

Population - cont

Beatty:

- Approximately 30 miles southwest (downgradient) from Pahute Mesa
- Approximately 25 miles southwest of ER-EC-11
  - Offsite well located on the Nevada Test and Training Range
  - Tritium detected 2009
  - 12,000 picocuries per liter (60% of EPA standard)
- Population of 1,010 people (2010 census)

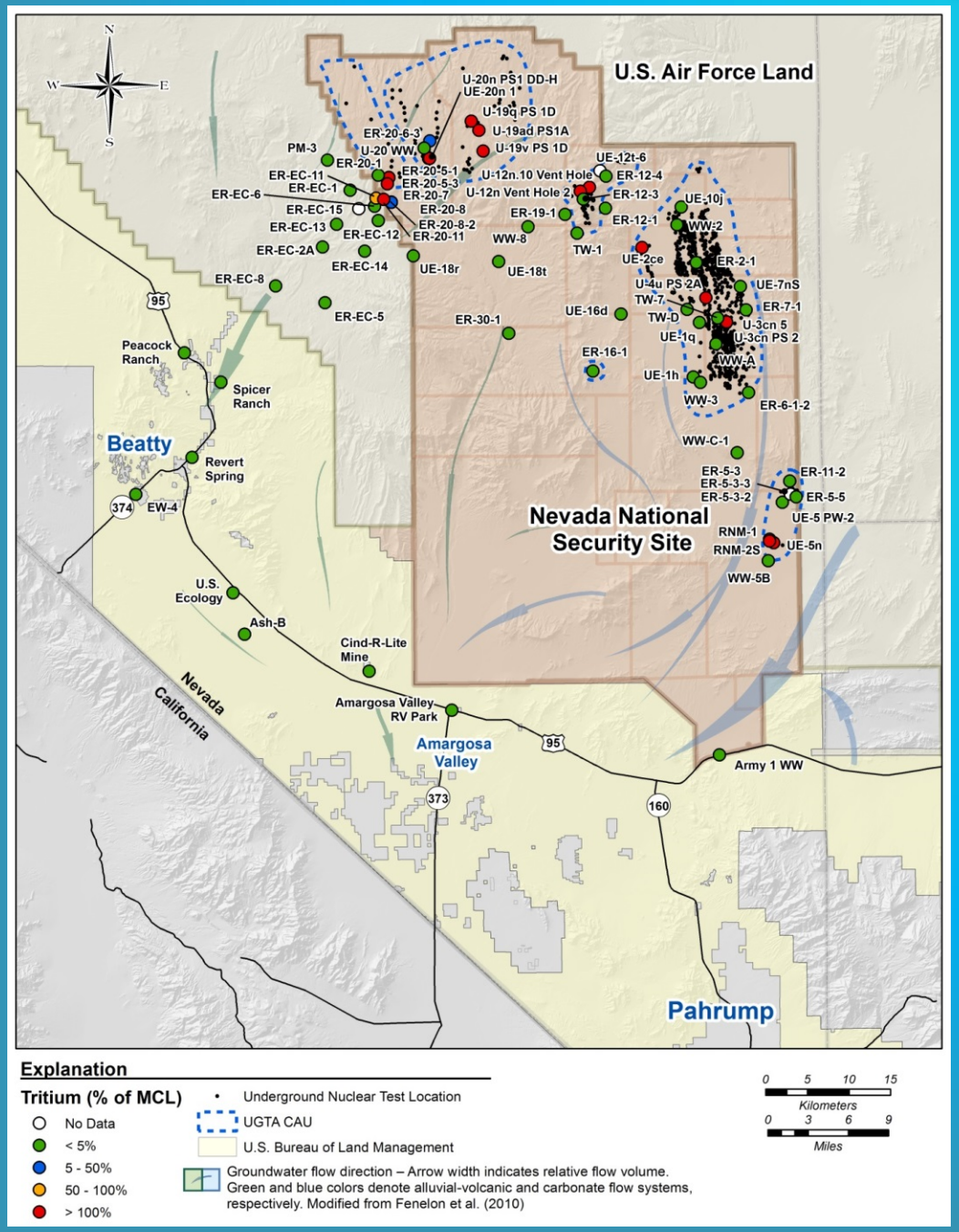
Responsibilities

- Nye County is responsible for:
  - Identification of sampling locations (will consider input from the Community Environmental Monitors [CEMs])
  - Developing sampling plans and procedures – ensures systematic, consistent sampling methodology
  - Collection of water samples
  - Obtaining tritium analysis though independent laboratories certified by the State of Nevada
  - Checking the data to ensure quality
  - Providing sampling methodology, data, and quality check results to DOE for inclusion in the Annual NNSS Site Environmental Report
- Fact sheets, brochures or handouts
- Local government awareness
- Public meetings and community events
- Engage the CEMs to ensure public's perspective is represented
- Data dissemination options include publication on the Nye County website (www.nyecounty.com) and/or continued publication on DRI's CEMP website (www.cemp.dri.edu)

CEMP Stations and Focus Area

- Map at right shows CEMP stations (www.cemp.dri.edu)
- Regional groundwater flow direction is predominantly north to south
- Downgradient areas outlined in blue
- Note that we are characterizing conditions in offsite areas only, although previous efforts included upgradient sites as well

Locations Sampled By DOE



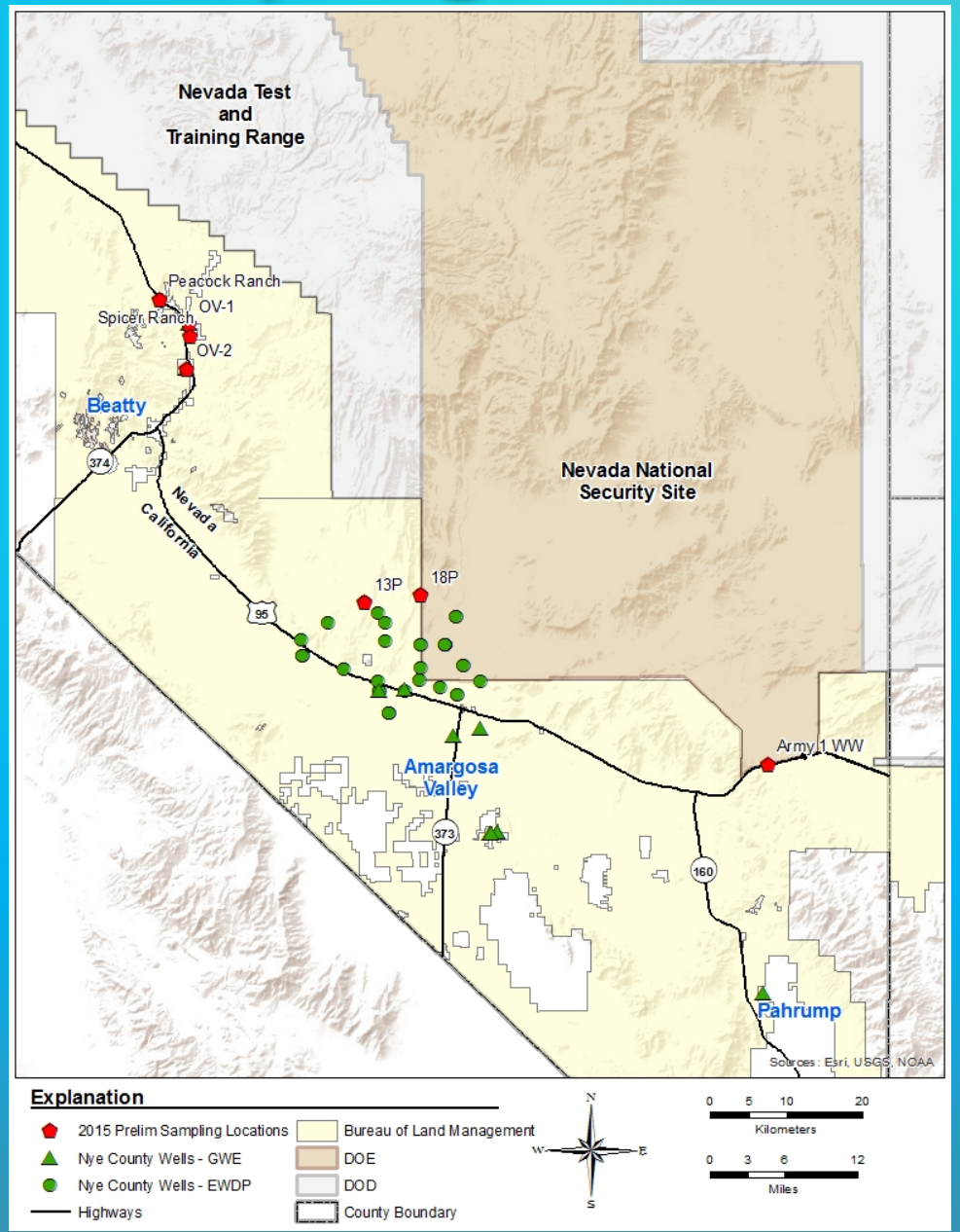
- Map shows sampled sites under the NNSS Integrated Groundwater Monitoring Program on and off the NNSS and NTTR
- Tritium results are represented as a percentage of the Maximum Contaminant Level (20,000 pCi/l, as defined by the US Environmental Protection Agency)
- Note localized variations in the groundwater flow directions
- Focus area for this study is primarily south and southwest of the NNSS and NTTR

Determining Nye County Sample Locations

- Data from the CEMP water sampling program will allow us to learn more about:
  - Quality of waters (tritium) adjacent to and downgradient from the NNSS and NTTR
  - Changes in water quality with time (tritium)
- Initial screening of candidate sites was based on the following criteria:
  - Proximity to population centers
  - Groundwater gradient (flow directions)
  - Geology/Hydrology
    - Faults
    - Rock/Soil types
  - Use results from above sources to locate candidate wells and springs
    - Availability/Access
    - Screened intervals
    - Casing type and diameter
  - Desire to broaden baseline from locations previously sampled, to include some of the wells drilled by Nye County as part of past scientific characterization programs
  - Sampled 10 locations in 2015, and plan to sample 20 locations each additional year of the program

Nye County Identified Sampling Locations 2015 (pre-sampling)

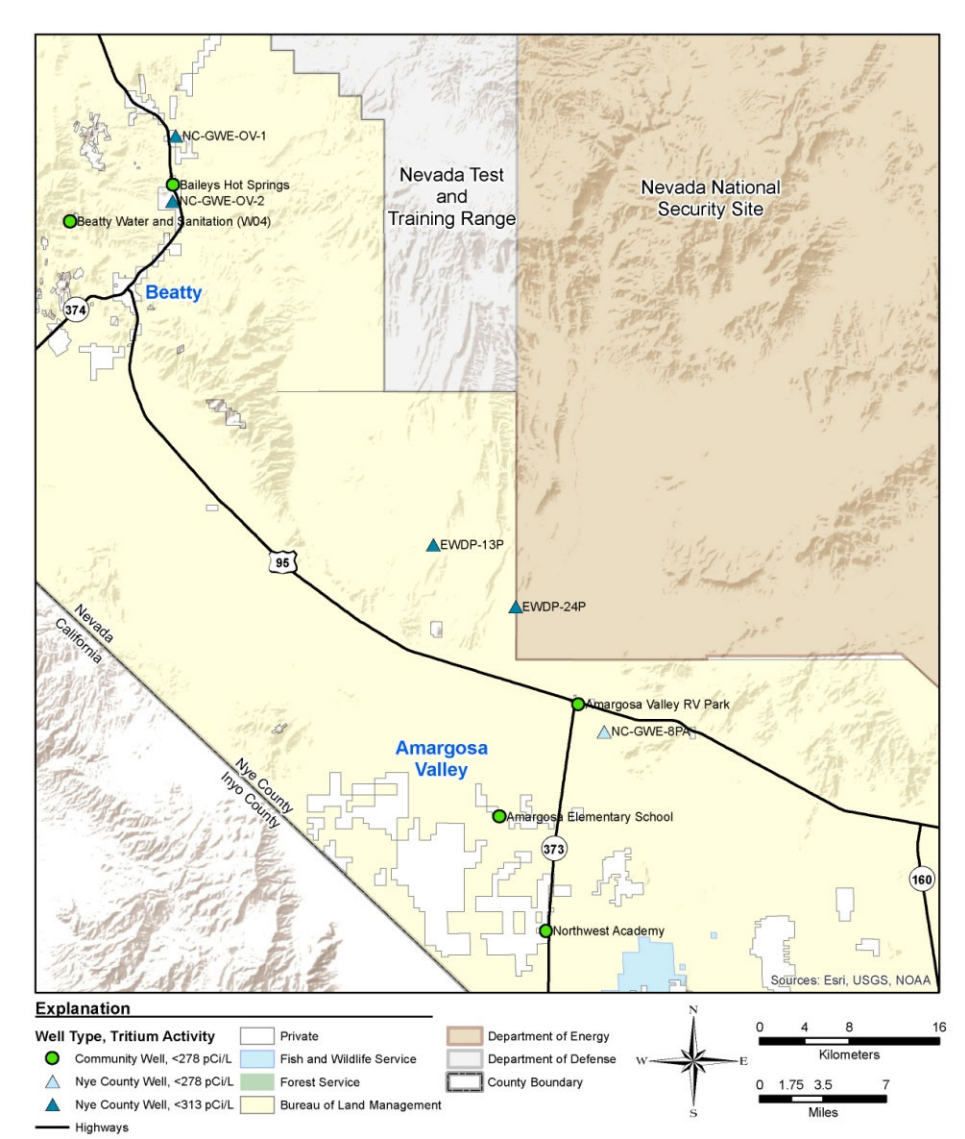
- Nye County considers the following wells to be of high sampling priority:
  - OV-1*
  - OV-2 *
  - Spicer Ranch
  - Peacock Ranch
  - 18P (REPLACED BY 24P)*
  - 13P *
  - Army 1 WW
  - * = sampled in 2015



2015 Sampling Results

- Location of 10 core wells
  - To be sampled every year
  - Test results showed all ten wells had undetectable levels of tritium

- GWE-OV-1
- GWE-OV-2
- EWDP-13P
- EWDP-24P
- GWE-8PA
- Amargosa Elementary School
- Amargosa Valley RV Park
- Beatty Water and Sanitation (W04)
- Northwest Academy
- Baileys Hot Springs



2015 Sampling Results – cont

- Independent Lab
  - Radiation Safety Engineering, Inc (Chandler AZ)
  - 10 samples plus 3 QA samples – 2 blanks 1 duplicate

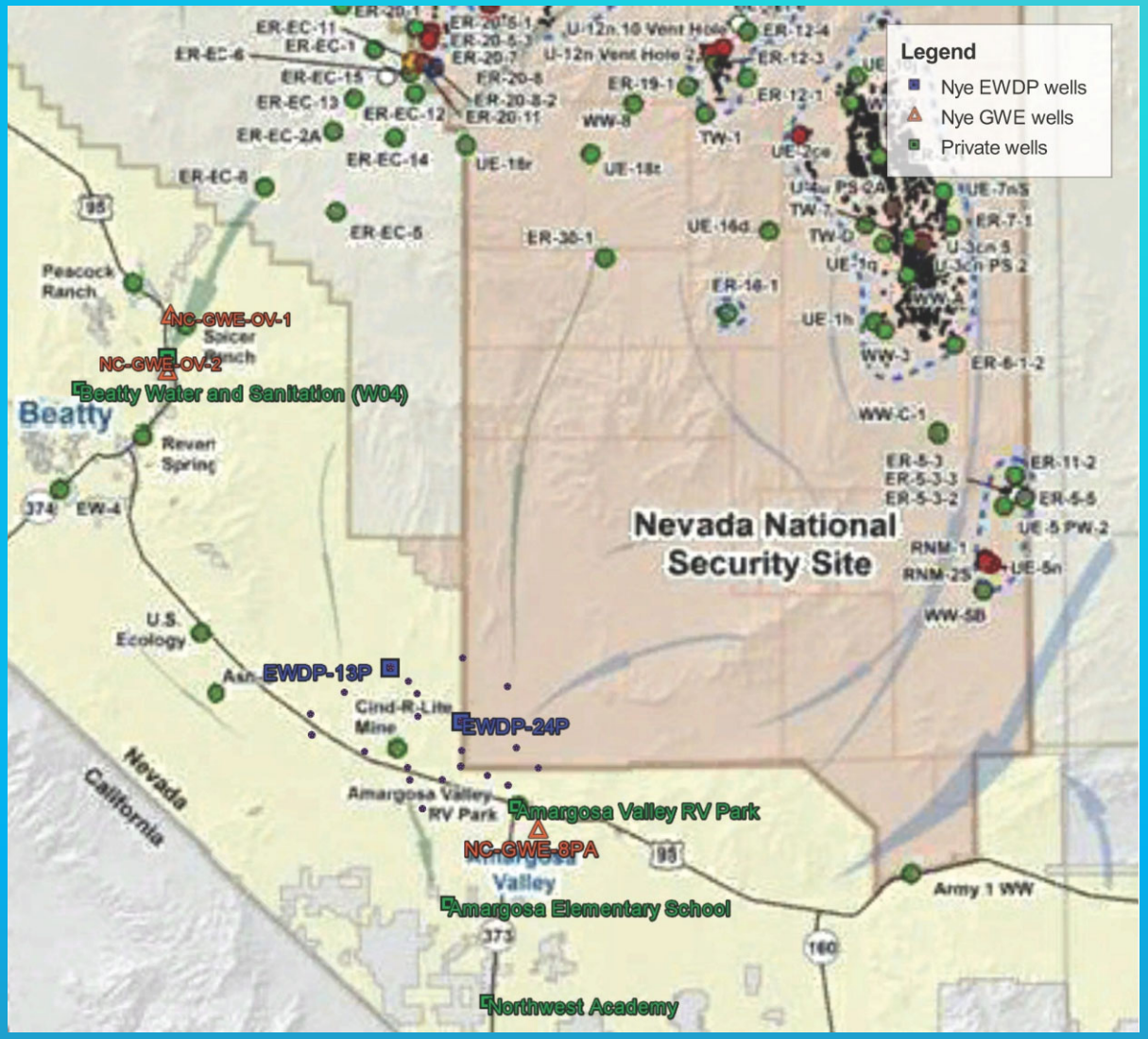
Nye - CEMP "core well" samples 2015							
Sample number	Sample name	Location	Latitude NAD83	Longitude NAD83	Date sampled	Time (hours)	Tritium Activity (pCi/L)
GWS0328	GWE-OV-1	NC-GWE-OV-1 *	37.0061820	-116.7207580	12/10/15	1312	<313
GWS0329	GWE-OV-2	NC-GWE-OV-2 *	36.9645540	-116.7229820	12/17/15	1232	<313
GWS0330	EWDP-13P	EWDP-13P *	36.7444070	-116.5139540	12/9/15	1600	<313
GWS0331	EWDP-24P	EWDP-24P * (substitute for 18P)	36.7046597	-116.4479878	12/7/15	1444	<313
GWS0332	GWE-8PA	NC-GWE-8PA	36.6244220	-116.3770836	12/8/15	1511	<278
GWS0333	AES	Amargosa Elementary School	36.569612	-116.460946	12/21/15	1129	<278
GWS0334	AV RV Park	Amargosa Valley RV Park	36.641735	-116.397474	12/16/15	1036	<278
GWS0335	BW&S W04	Beatty Water and Sanitation (W04)	36.951458	-116.805002	12/16/15	1200	<278
GWS0336	NW Academy	Northwest Academy	36.496166	-116.423563	12/21/15	1405	<278
GWS0337	Bailey's Hot Spr	Baileys Hot Springs	36.974720	-116.722500	12/16/15	1531	<278
GWS0338	GWE-OV-3	Nc-GWE-OV-1 - duplicate *	----------	----------	12/10/15	1315	<278
GWS0339	GWE-OV-30	Bailey's Hot Springs- blank	----------	----------	12/16/15	1540	<313
GWS0340	Well 2	Amargosa Elementary School-duplicate	----------	----------	12/21/15	1134	<313

CEM picks

2015 Sampling Results – cont

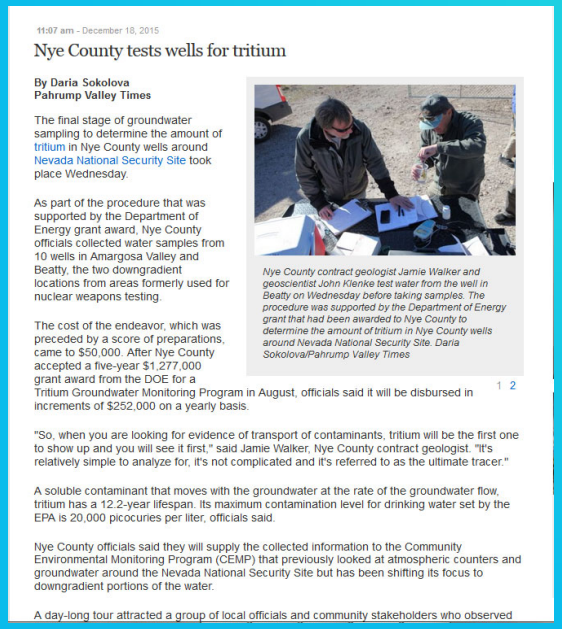
- Community wells
- Nye GWE wells
- Nye EWDP wells

- Flow paths
- DOE sampling locations



2015 -Public Outreach

- Two articles ran in the local newspaper (PVT)
- Tour for the NSSAB and CEM's (Dec 16th)
- Supplied sampling results to the DOE to be included in the 2015 NNSSER
- Presented poster of results at the 2016 DOE Groundwater Open House - Amargosa July 29, 2016



11:07 am - December 18, 2015

Nye County tests wells for tritium

By Daria Sokolova
Pahrump Valley Times

The final stage of groundwater sampling to determine the amount of tritium in Nye County wells around Nevada National Security Site took place Wednesday.

As part of the procedure that was supported by the Department of Energy grant award, Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty, the two downgradient locations from areas formerly used for nuclear weapons testing.

Nye County contract geologist Jamie Walker and geoscientist John Klenke test water from the well in Beatty on Wednesday before taking samples. The procedure was supported by the Department of Energy grant that had been awarded to Nye County to determine the amount of tritium in Nye County wells around Nevada National Security Site. Daria Sokolova/Pahrump Valley Times

The cost of the endeavor, which was preceded by a score of preparations, came to $50,000. After Nye County accepted a five-year $1,277,000 grant award from the DOE for a Tritium Groundwater Monitoring Program in August, officials said it will be disbursed in increments of $252,000 on a yearly basis.

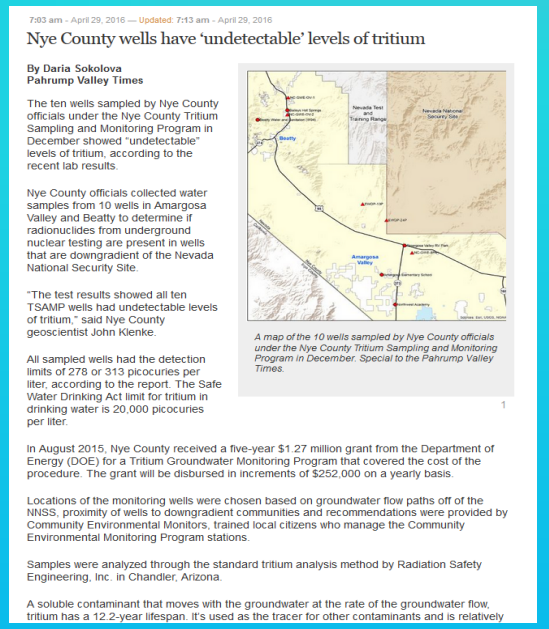
1 2

"So, when you are looking for evidence of transport of contaminants, tritium will be the first one to show up and you will see it first," said Jamie Walker, Nye County contract geologist. "It's relatively simple to analyze for, it's not complicated and it's referred to as the ultimate tracer."

A soluble contaminant that moves with the groundwater at the rate of the groundwater flow, tritium has a 12.2-year lifespan. Its maximum contamination level for drinking water set by the EPA is 20,000 picocuries per liter, officials said.

Nye County officials said they will supply the collected information to the Community Environmental Monitoring Program (CEMP) that previously looked at atmospheric counters and groundwater around the Nevada National Security Site but has been shifting its focus to downgradient portions of the water.

A day-long tour attracted a group of local officials and community stakeholders who observed



7:03 am - April 29, 2016 — Updated: 7:13 am - April 29, 2016

Nye County wells have 'undetectable' levels of tritium

By Daria Sokolova
Pahrump Valley Times

The ten wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December showed "undetectable" levels of tritium, according to the recent lab results.

Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty to determine if radionuclides from underground nuclear testing are present in wells that are downgradient of the Nevada National Security Site.

"The test results showed all ten TSAMP wells had undetectable levels of tritium," said Nye County geoscientist John Klenke.

All sampled wells had the detection limits of 278 or 313 picocuries per liter, according to the report. The Safe Water Drinking Act limit for tritium in drinking water is 20,000 picocuries per liter.

A map of the 10 wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December. Special to the Pahrump Valley Times.

1

In August 2015, Nye County received a five-year $1.27 million grant from the Department of Energy (DOE) for a Tritium Groundwater Monitoring Program that covered the cost of the procedure. The grant will be disbursed in increments of $252,000 on a yearly basis.

Locations of the monitoring wells were chosen based on groundwater flow paths off of the NNSS, proximity of wells to downgradient communities and recommendations were provided by Community Environmental Monitors, trained local citizens who manage the Community Environmental Monitoring Program stations.

Samples were analyzed through the standard tritium analysis method by Radiation Safety Engineering, Inc. in Chandler, Arizona.

A soluble contaminant that moves with the groundwater at the rate of the groundwater flow, tritium has a 12.2-year lifespan. It's used as the tracer for other contaminants and is relatively

DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

December 29, 2015 - 12:25pm

RELATED ARTICLES

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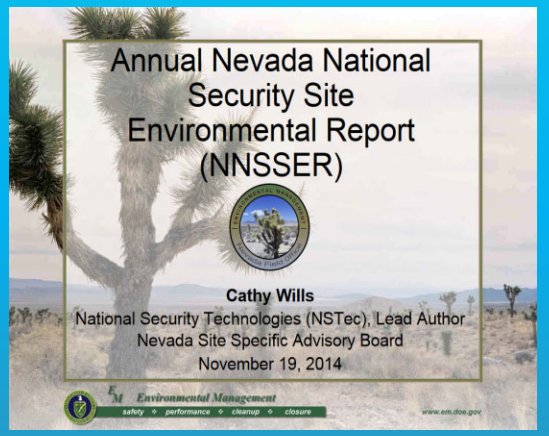
Email Updates

Tour participants are briefed on the Nye County Community-Based Groundwater Monitoring Program before observing sampling at the Amargosa Valley RV Park.

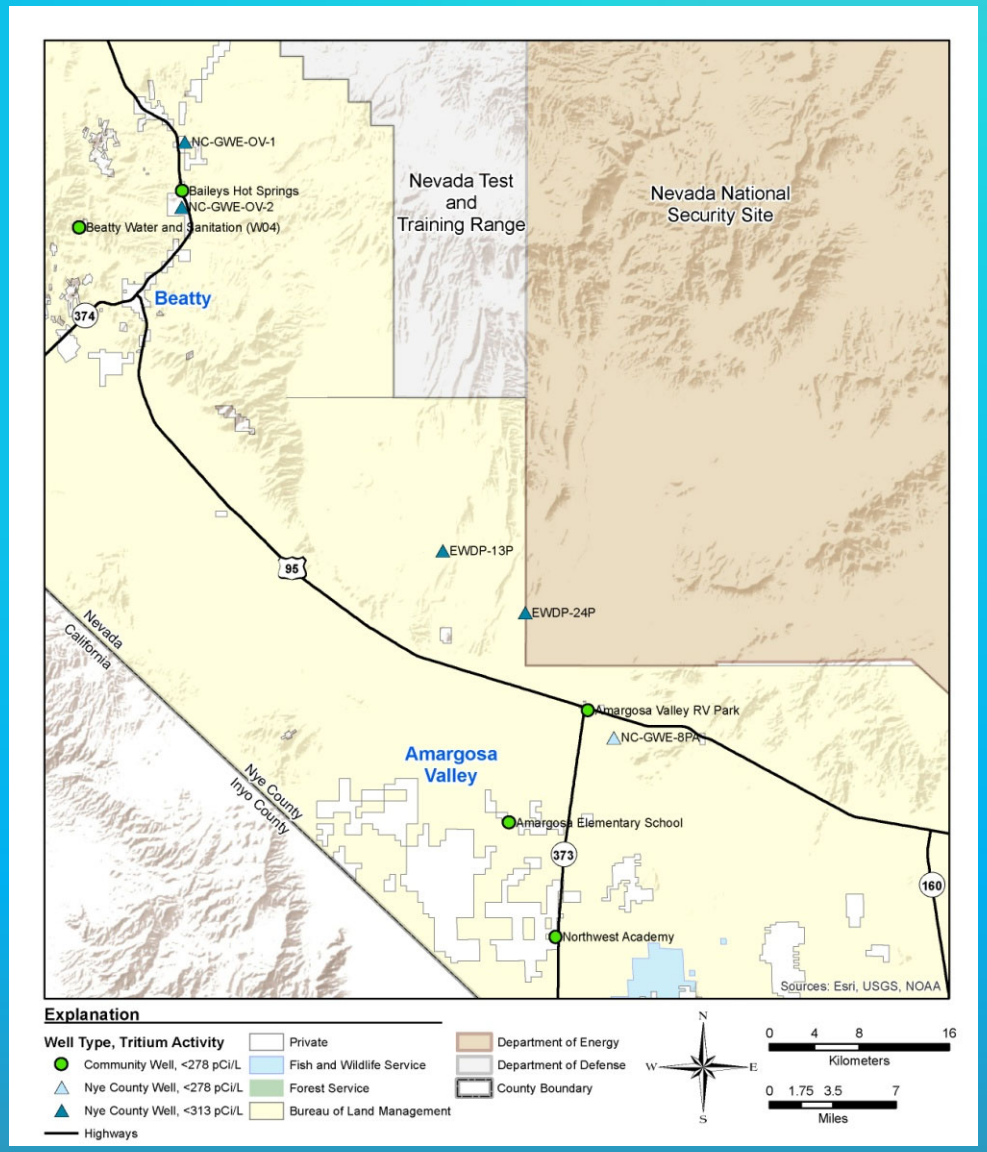


Additional Sampling Locations

- For discussion at the breakout session:
  - What are the priorities for well sampling locations?
    - Wells used by communities?
    - Wells that provide early detection but may not be portable water sources?
  - What wells or other locations do CEMs consider to be of highest priority?
  - What locations do you feel should be sampled?
    - 2016
    - In future years (2017- 2019)
  - When making your recommendations, please consider:
    - Past sampling results
      - Tritium hits and flow paths
      - Age of water (Tritium half-life = 12.32 yrs – less than 1% in 7 half-lives (86 yrs)
  - Would you like to participate in the water sampling? We welcome any participation!

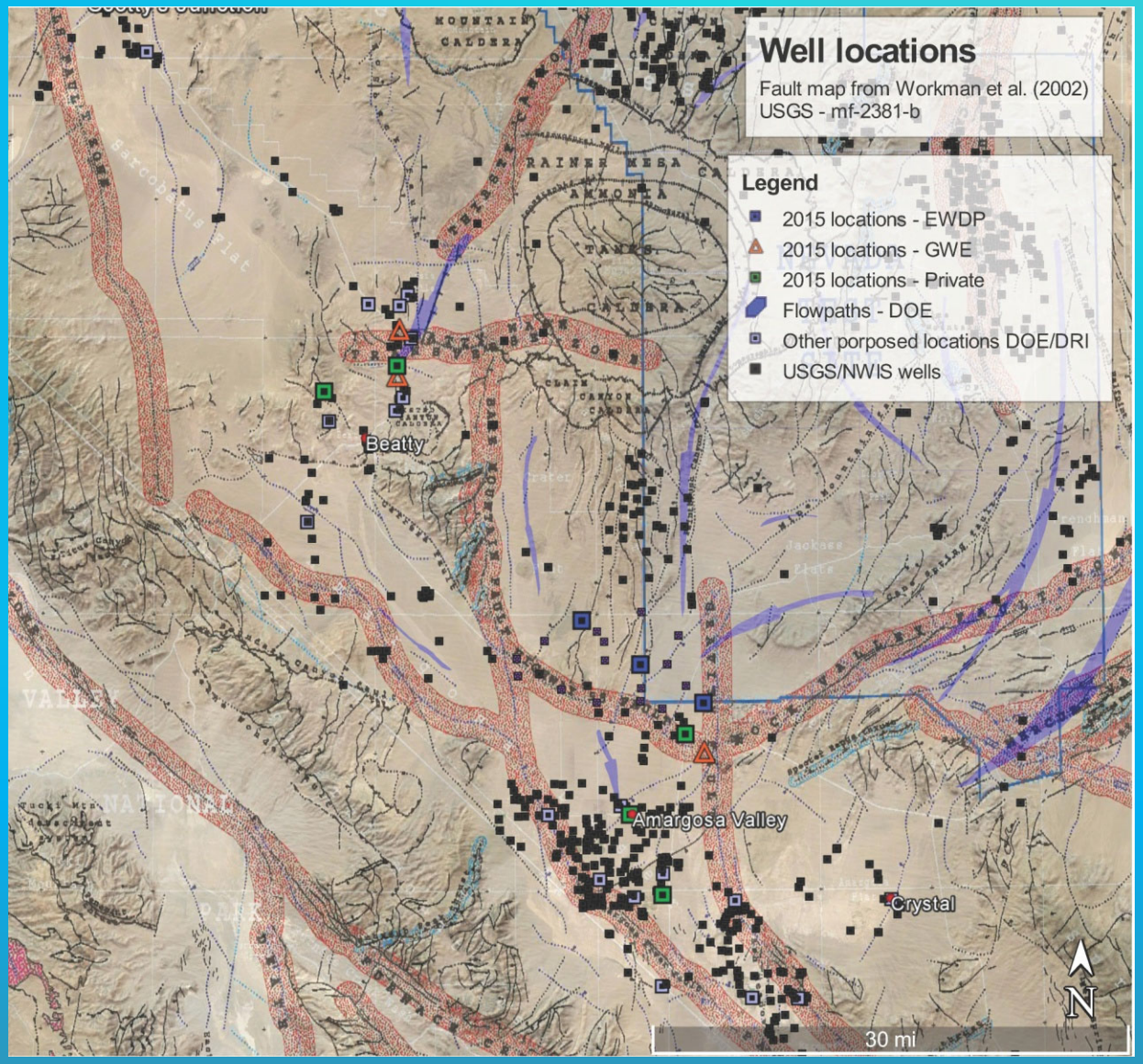
Additional Sampling Locations

- Location of 10 "core wells"
  - We need to select (add) 10 additional wells for the 2016 sampling program
  - What wells or other locations do CEMs consider to be of highest priority?



Additional Sampling Locations – cont

- Well locations
  - USGS/NWIS



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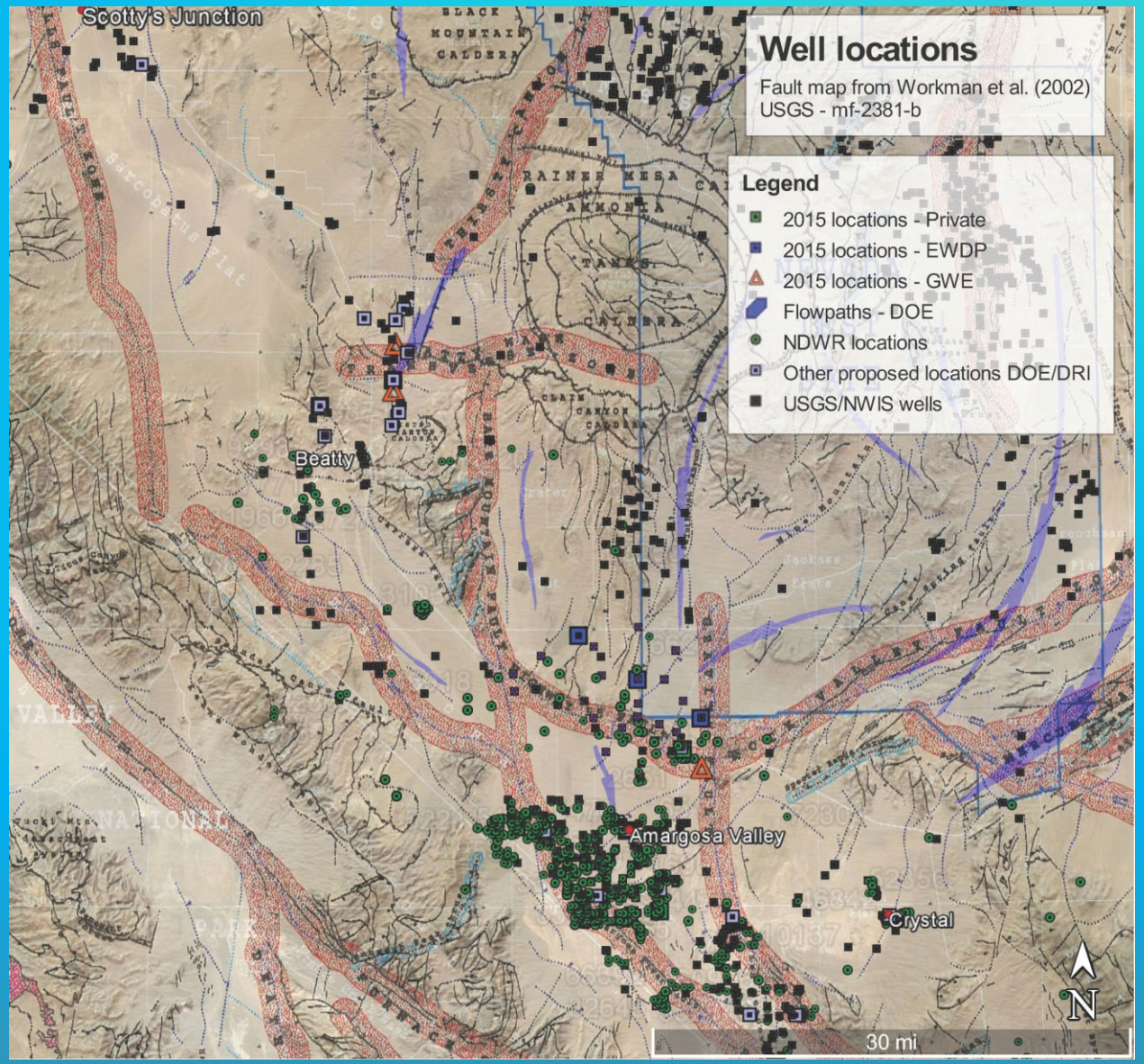

Future Years

- We would like to continue working with the CEMs through face-to-face meetings, community events, and other opportunities to identify locations of interest for sampling
- We need your help to ensure data are collected in the areas of greatest concern for the communities!

Acknowledgement

- Nye County would like to thank the Department of Energy (NNSA/NFO) and the Desert Research Institute for the opportunity to become affiliated with the CEMP

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM 2018 UPDATE

Nye County Nuclear Waste Repository Project Office
John Klenke
July 25, 2018

MATERIAL IN THE FOLLOWING PRESENTATION SOLELY REPRESENTS THE VIEW POINT OF THE AUTHOR AND DOES NOT REPRESENT DRI OR DOE.

Overview

- Background
- Land Status
- Population
- Responsibilities
- CEMP Stations and Focus Area
- Locations Sampled by DOE
- Determining Nye County Sample Locations
- 2015 – 2017 Sampling Results
- ER-OV wells
- Public Outreach
- Quality Assurance
- Town Board Meetings
- Possible Sampling Locations for 2018
- Future Years
- Acknowledgements

Background – Why Are We Here?

- Nye County has the duty to protect the health and safety of citizens
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Pahrump:

- Approximately 26 miles south from NNSS
- Population of 38,000 people (2012)
- Estimated 73,000 people by 2060 (at 1.5% growth rate - NCWD)

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- Population of 1,456 (2010 census)

Population - cont

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- Map at right shows CEMP stations (6/26/18) (www.cemp.dri.edu)
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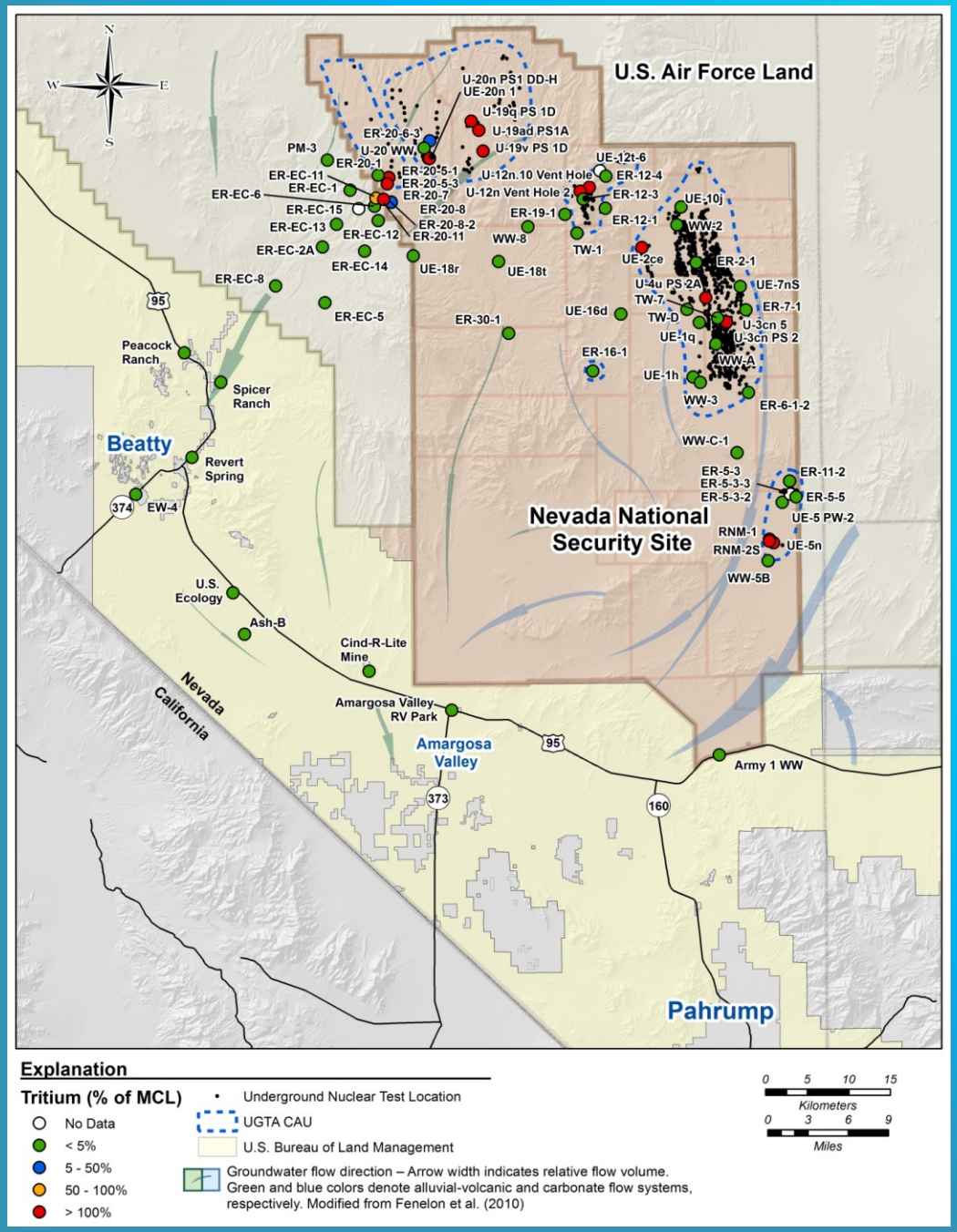
- Downgradient areas outlined in blue
- Note that we are characterizing conditions in offsite areas only

*Image from CEMP website

Locations Sampled By DOE



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Determining Nye County Sample Locations

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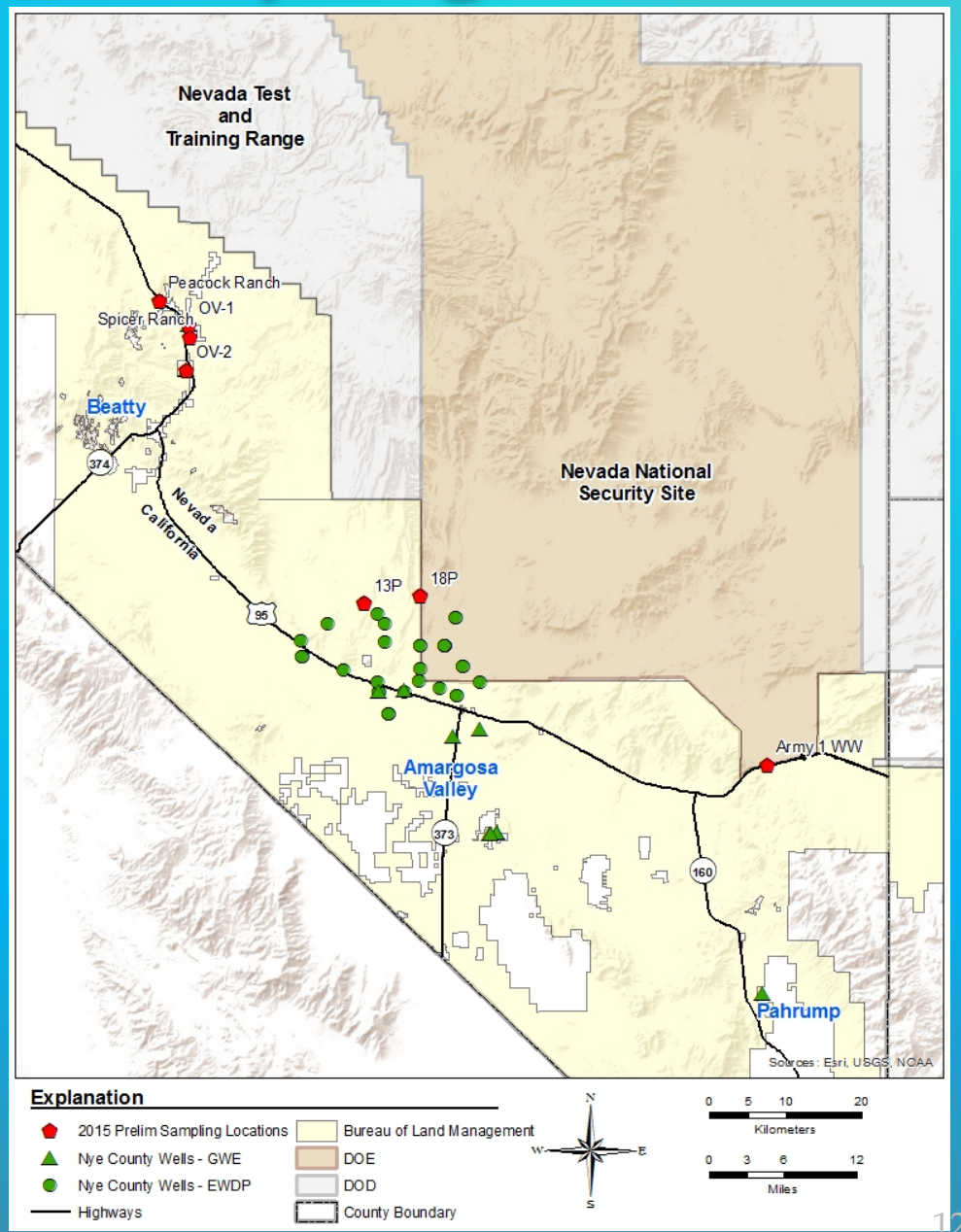
  - Desire to broaden baseline from locations previously sampled, to include some of the wells drilled by Nye County as part of past scientific characterization programs
  - Sampled 10 locations in 2015, and 20 locations in 2016 and 2017

Nye County Identified Sampling Locations 2015 (pre-sampling)

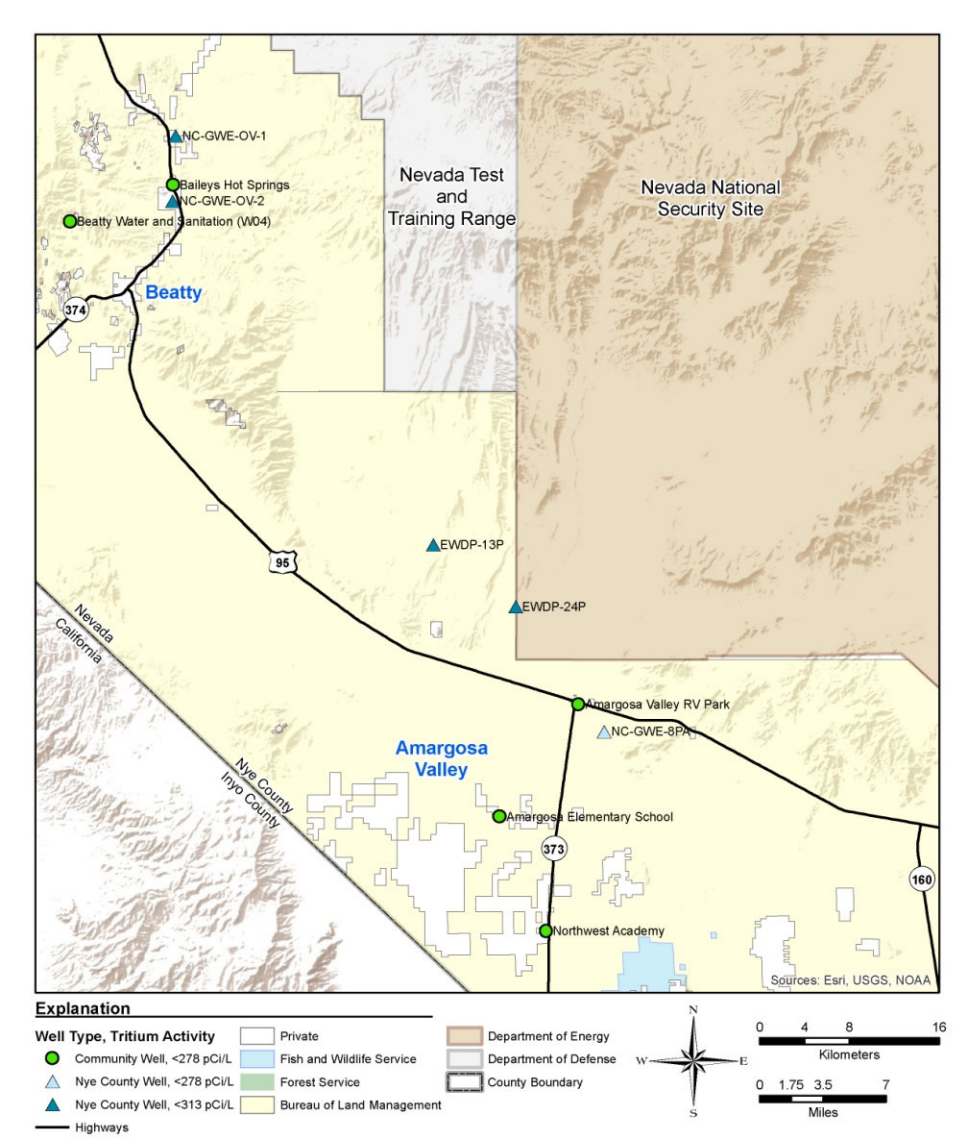
- Nye County considers the following wells to be of high sampling priority:
  - OV-1
  - OV-2
  - Spicer Ranch
  - Peacock Ranch
  - 18P (Replaced by 24P – offsite well)
  - 13P
  - Army 1 WW



2015 Sampling Results

- Established 10 core wells
  - Core wells sampled every year
  - GWE-OV-1
  - GWE-OV-2
  - EWDP-13P
  - EWDP-24P
  - GWE-8PA
  - Amargosa Elementary School
  - Amargosa Valley RV Park
  - Beatty Water and Sanitation (W04)
  - Northwest Academy
  - Baileys Hot Springs

- Test results showed all 10 wells had undetectable levels of tritium in 2015, 2016, and 2017



2016 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
  - NC-GWE-33PA
  - EWDP-1DX-Shallow
  - Amargosa Narrows South Well 1
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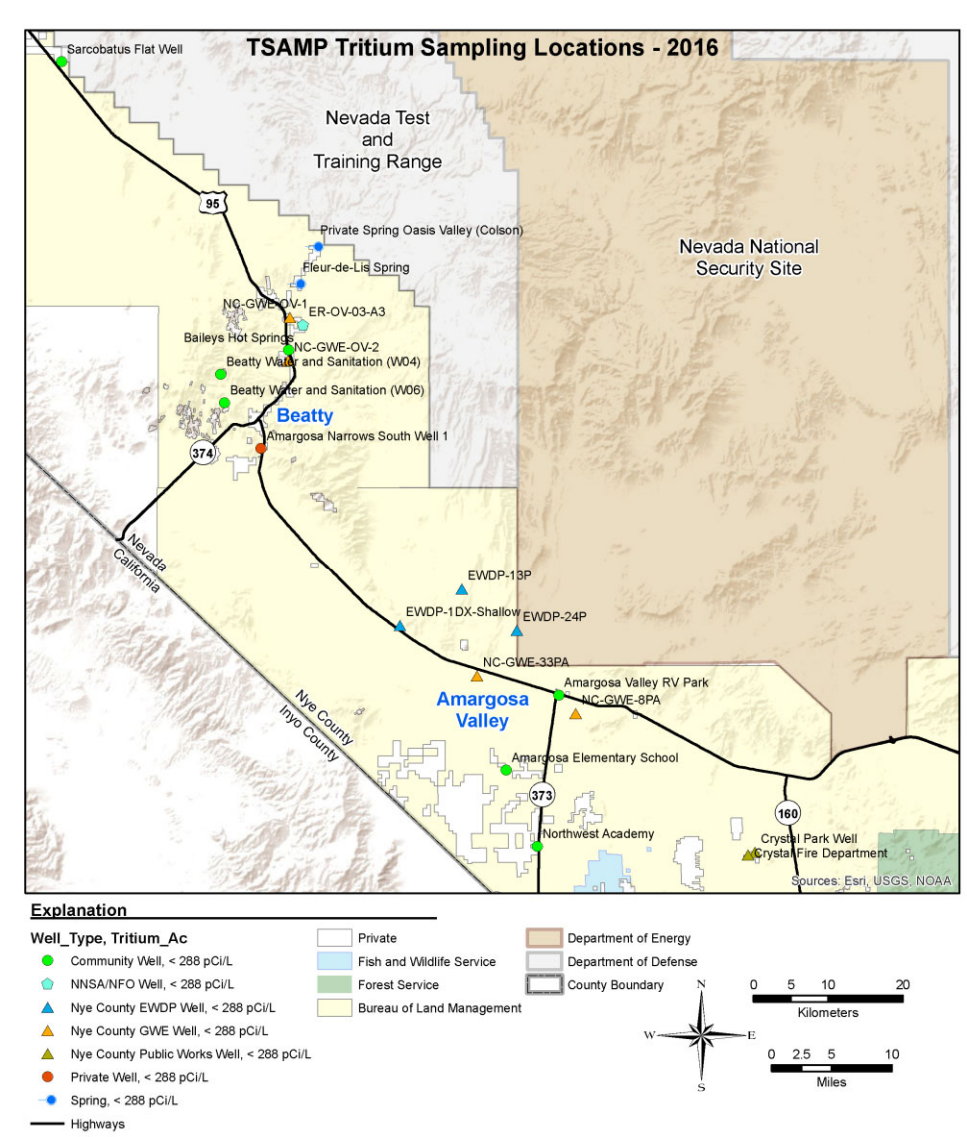

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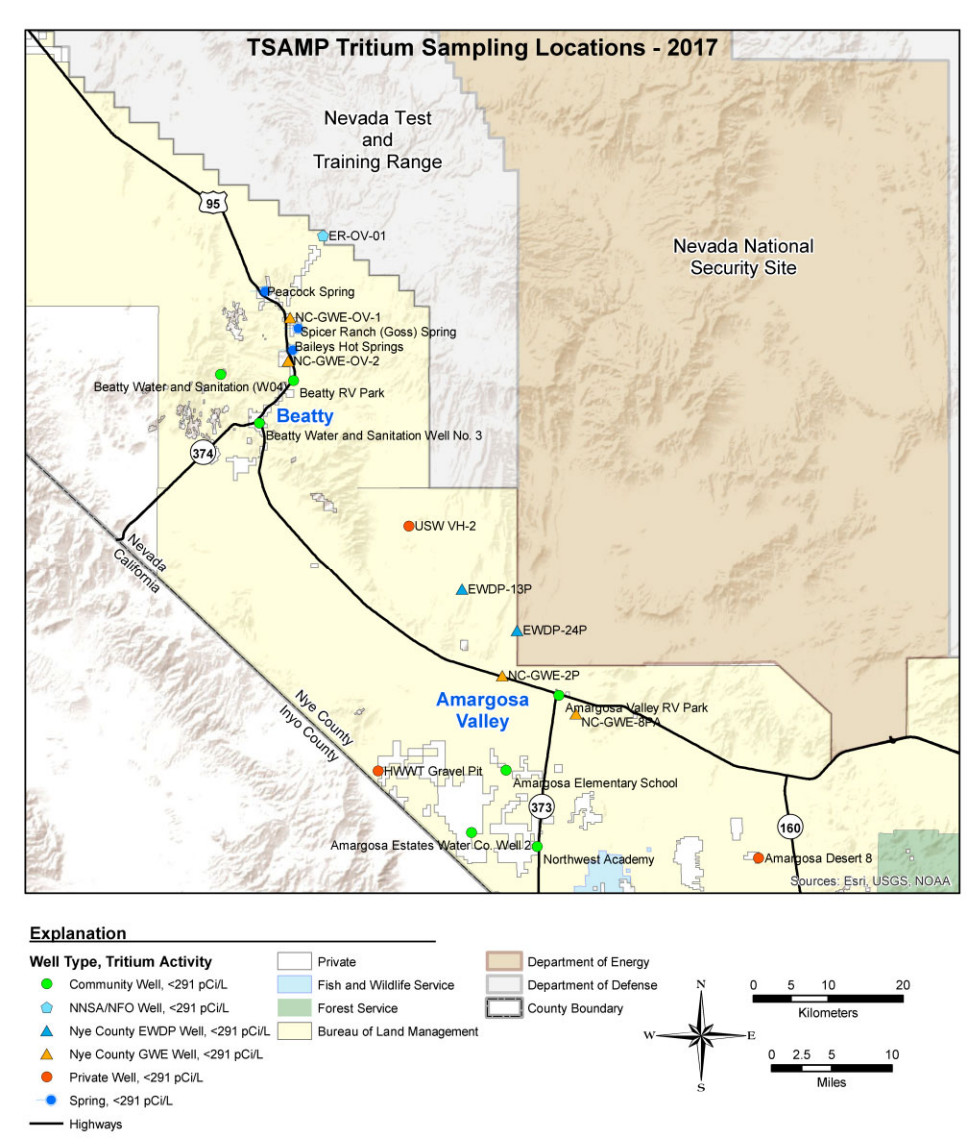

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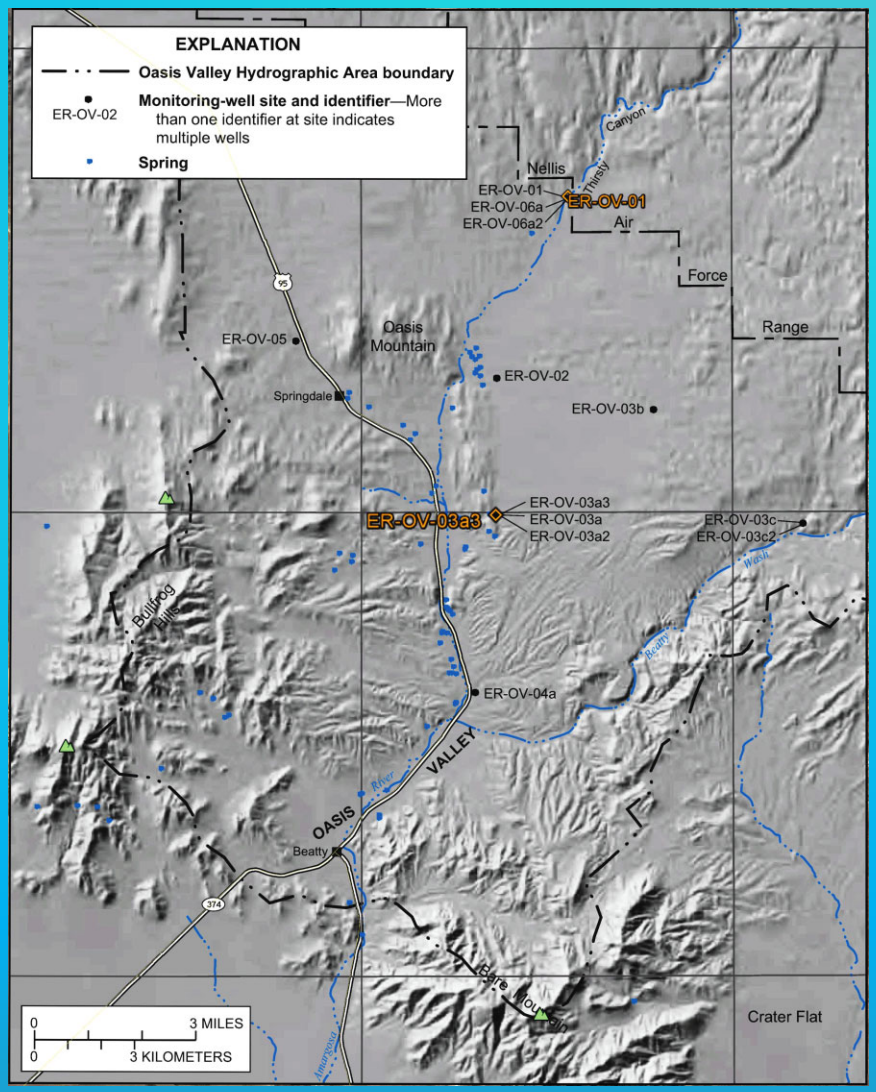

* Image from USGS WRIR 98-4184

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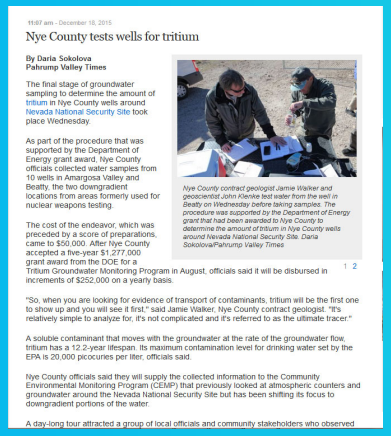

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By Daria Sokolova
Pahrump Valley Times

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As part of the procedure that was supported by the Department of Energy grant award, Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty, the two downgradient locations from areas formerly used for nuclear weapons testing.

The cost of the endeavor, which was preceded by a score of preparations, came to $50,000. After Nye County accepted a five-year $1,277,000 grant award from the DOE for a Tritium Groundwater Monitoring Program in August, officials said it will be disbursed in increments of $252,000 on a yearly basis.

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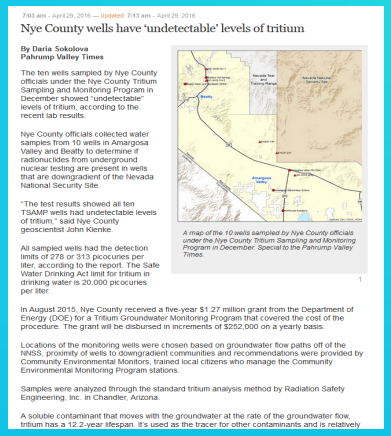

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All sampled wells had the detection limits of 278 or 313 picocuries per liter, according to the report. The Safe Water Drinking Act limit for tritium in drinking water is 20,000 picocuries per liter.

A map of the 10 wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December. Special to the Pahrump Valley Times.

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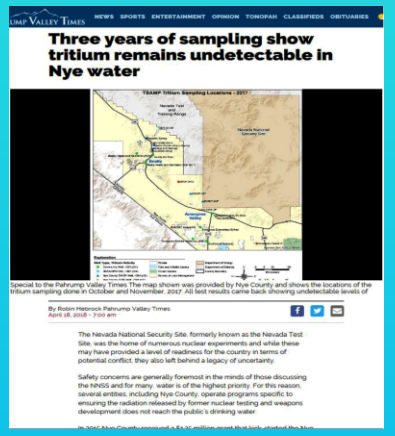
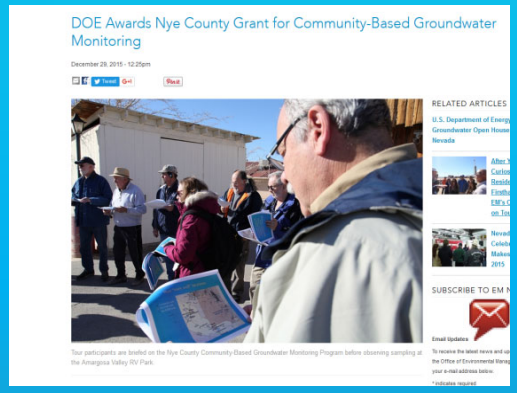


Three years of sampling show tritium remains undetectable in Nye water

By Robin Hebrock Pahrump Valley Times
April 18, 2018 - 7:00 am

The Nevada National Security Site, formerly known as the Nevada Test Site, was the home of numerous nuclear experiments and while these may have provided a level of readiness for the country in terms of potential conflict, they also left behind a legacy of uncertainty.

Safety concerns are generally foremost in the minds of those discussing the NNSS and for many, water is of the highest priority. For this reason, several entities, including Nye County, operate programs specific to ensuring the radiation released by former nuclear testing and weapons development does not reach the public's drinking water.



DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

December 29, 2015 - 12:25pm

RELATED ARTICLES

SUBSCRIBE TO EM

Tour participants are briefed on the Nye County Community-Based Groundwater Monitoring Program before observing sampling at the Amargosa Valley RV Park.

Annual Nevada National Security Site Environmental Report (NNSSER)

Cathy Wills
National Security Technologies (NSTec), Lead Author
Nevada Site Specific Advisory Board
November 19, 2014

Environmental Management
safety ❖ performance ❖ cleanup ❖ closure
www.em.doe.gov

* Report in progress

Quality Assurance

- Nye County coordinates sampling efforts through Quality Assurance Officer (QAO)
- Nye County conducts annual internal audits to insure integrity of TSaMP data
  - Audit conducted by qualified professional (QAO)
  - Field surveillances
  - Office surveillances
  - Reports submitted to NWRPO
- Since 2016, Nye County has been hosting preliminary reconnaissance fieldtrips with the DOE EM Nevada Program to insure maximum benefits will be gained from site selections

December 18, 2016

Darrell Lacy, Director
Nye County TSAMP Project Director
250 N. Hwy 160 #1
Pahrump, NV 89060

Nye County TSAMP Internal Audit Report, TSAMP-2016-01

Enclosed please find the TSAMP internal audit report, TSAMP-2016-01, conducted December 5-7, 2016. Included in the audit report are 3 observations and 1 finding that were made during the audit along with suggested corrective actions and recommendations. The finding was addressed during the audit, and all data packages will be submitted in a timely manner. If you have any questions please let me know or you can also refer to QAP-18.1.

Regards,

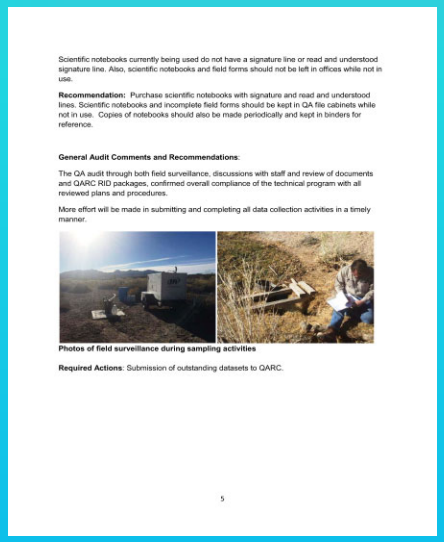
Kathy Gilmore

Quality Assurance Officer

Cc: John Klenke,
Celeste Sandoval/QARC

Attachments: Audit Report and Audit Checklist

1



Scientific notebooks currently being used do not have a signature line or read and understood signature line. Also, scientific notebooks and field forms should not be left in offices while not in use.

Recommendation: Purchase scientific notebooks with signature and read and understood lines. Scientific notebooks and incomplete field forms should be kept in QA file cabinets while not in use. Copies of notebooks should also be made periodically and kept in binders for reference.

General Audit Comments and Recommendations:

The QA audit through both field surveillance, discussions with staff and review of documents and QARC RID packages, confirmed overall compliance of the technical program with all reviewed plans and procedures.

More effort will be made in submitting and completing all data collection activities in a timely manner.

Photos of field surveillance during sampling activities

Required Actions: Submission of outstanding datasets to QARC.

5

2017 Town Board Meetings

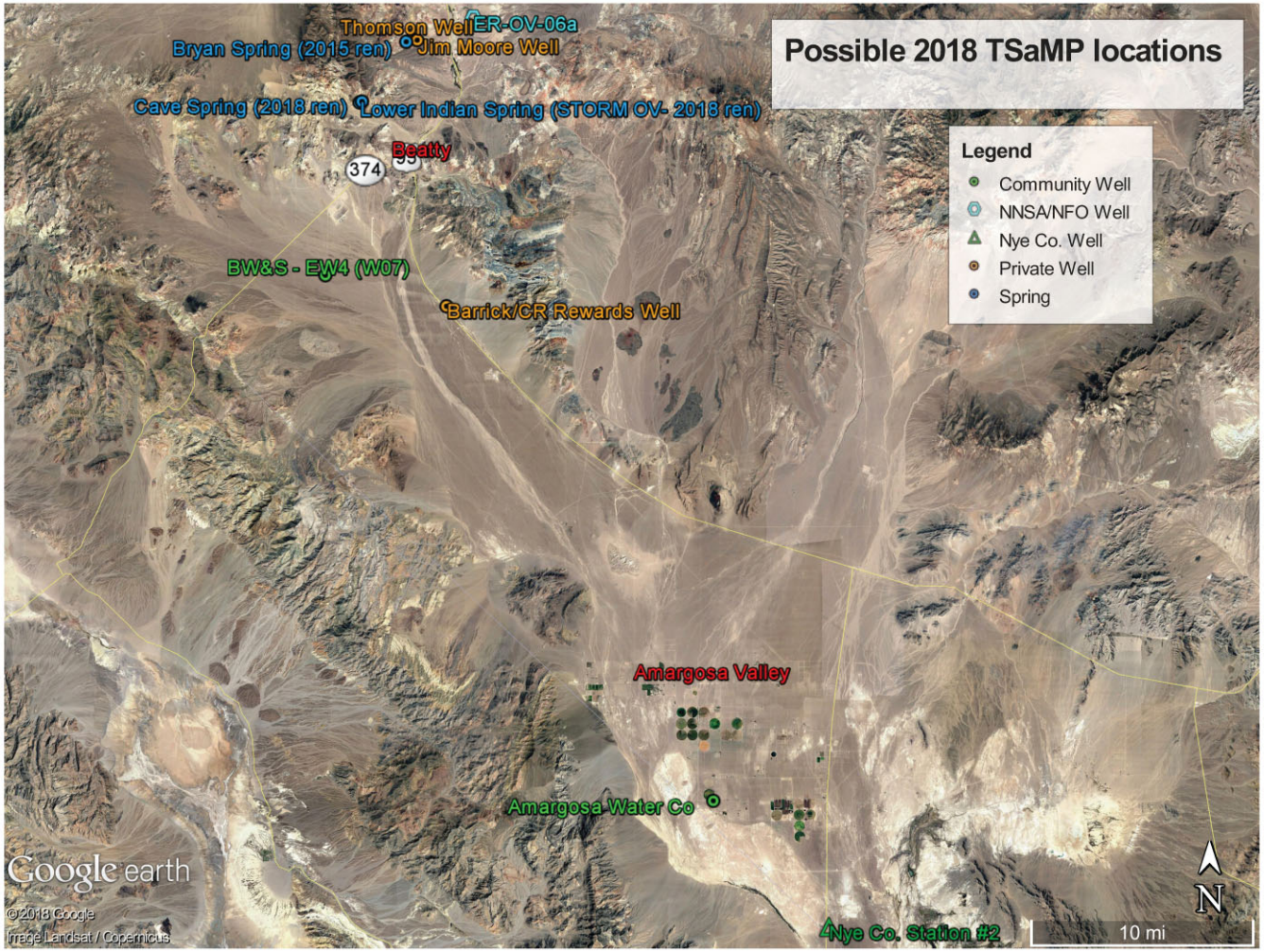
- New effort in 2017
- TSaMP presentations were given at Beatty Town Board meeting 9/25/17, and Amargosa Town Board meeting 9/27/17
- Resulted in three new sampling locations for 2017, and several potential new sites for future years.

Additional Sampling Locations

- For discussion at the breakout session:
  - What are the priorities for well sampling locations?
    - Wells used by communities?
    - Wells that provide early detection but may not be portable water sources?
  - What wells or other locations do CEMs consider to be of highest priority?
  - What locations do you feel should be sampled?
    - 2018
    - In future years (2019)
  - When making your recommendations, please consider:
    - Past sampling results
      - Tritium hits and flow paths
      - Age of water (Tritium half-life = 12.32 yrs – less than 1% in 7 half-lives (86 yrs)
  - Would you like to participate in the water sampling? We welcome any participation!

Possible Sampling Locations for 2018

- Ten possible sampling locations to consider for 2018 and/or future years
- What wells or other locations do CEM's consider to be of highest priority?



Future Years

- Nye County is currently in the process of applying for a 2-year no cost grant extension
  (Aug 2020 ⟶ Aug 2022)
- We would like to continue working with the CEMs through face-to-face meetings, community events, and other opportunities to identify locations of interest for sampling
- We need your help to ensure data are collected in the areas of greatest concern for the communities!

Acknowledgements

- Nye County would like to thank the Department of Energy (NNSA/NFO) and the Desert Research Institute for the opportunity to be affiliated with the CEMP

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM 2019 UPDATE

Nye County Nuclear Waste Repository Project Office
John Klenke
July 26, 2019

MATERIAL IN THE FOLLOWING PRESENTATION SOLELY REPRESENTS THE VIEW POINT OF THE AUTHOR AND DOES NOT REPRESENT DRI OR DOE.

Overview

- Background
- Land Status
- Population
- Responsibilities
- CEMP Stations and Focus Area
- Locations Sampled by DOE
- Determining Nye County Sample Locations
- 2015 – 2018 Sampling Results
- ER-OV wells
- Public Outreach
- Quality Assurance
- Town Board Meetings
- Possible Sampling Locations for 2019
- Future Years
- Acknowledgements

Background – Why Are We Here?

- Nye County has the duty to protect the health and safety of citizens
- Through its Nuclear Waste Repository Project Office (NWRPO), Nye County conducted scientific characterization of the area between Yucca Mountain and the Town of Amargosa
  - Drilled and completed approximately 50 wells
  - Conducted numerous aquifer and tracer tests, geophysical surveys, water level measurements, and other specialized testing
  - Data provided to Department of Energy (DOE) for use in their repository characterization and safety analyses
- Tritium from former weapons tests has been observed moving, while still on government lands, offsite ; we conduct expanded monitoring activities to supplement continued DRI monitoring at communities in the down-gradient areas
- Entered into a five-year* grant with DOE to conduct water sampling and analysis at locations downgradient from areas formerly used for nuclear weapons testing

* 2-year no cost extension approved by DOE (to 8/16/2022)

Land Status

- Nye County encompasses 18,199 mi^2
  - Largest county (by area) in the state, and the third-largest in contiguous US.
- Approximately 98% of land in Nye County is federally controlled
  - Bureau of Land Management
  - US Forest Service
  - Department of Defense
  - Department of Energy
- Nevada National Security Site (NNSS; formerly the Nevada Test Site) is entirely within Nye County; part of the Nevada Test and Training Range (NTTR) lies within Nye County
- Nye County population of 44,202 (2017 - U.S. Census Bureau)

Population

Pahrump:

- Approximately 26 miles south from NNSS
- Population of 38,000 people (2012)
- Estimated 73,000 people by 2060 (at 1.5% growth rate - NCWD)

Amargosa:

- Approximately 9 miles SW from the border of NNSS
- 50 mile south (downgradient) from Pahute Mesa
- Population of 1,456 (2010 census)

Population - cont

Beatty:

- Approximately 30 miles southwest (downgradient) from Pahute Mesa
- Approximately 25 miles southwest of ER-EC-11
  - Offsite well located on the Nevada Test and Training Range
  - Tritium detected 2009
  - 12,000 picocuries per liter (60% of EPA standard)
- Population of 1,010 people (2010 census)

Responsibilities

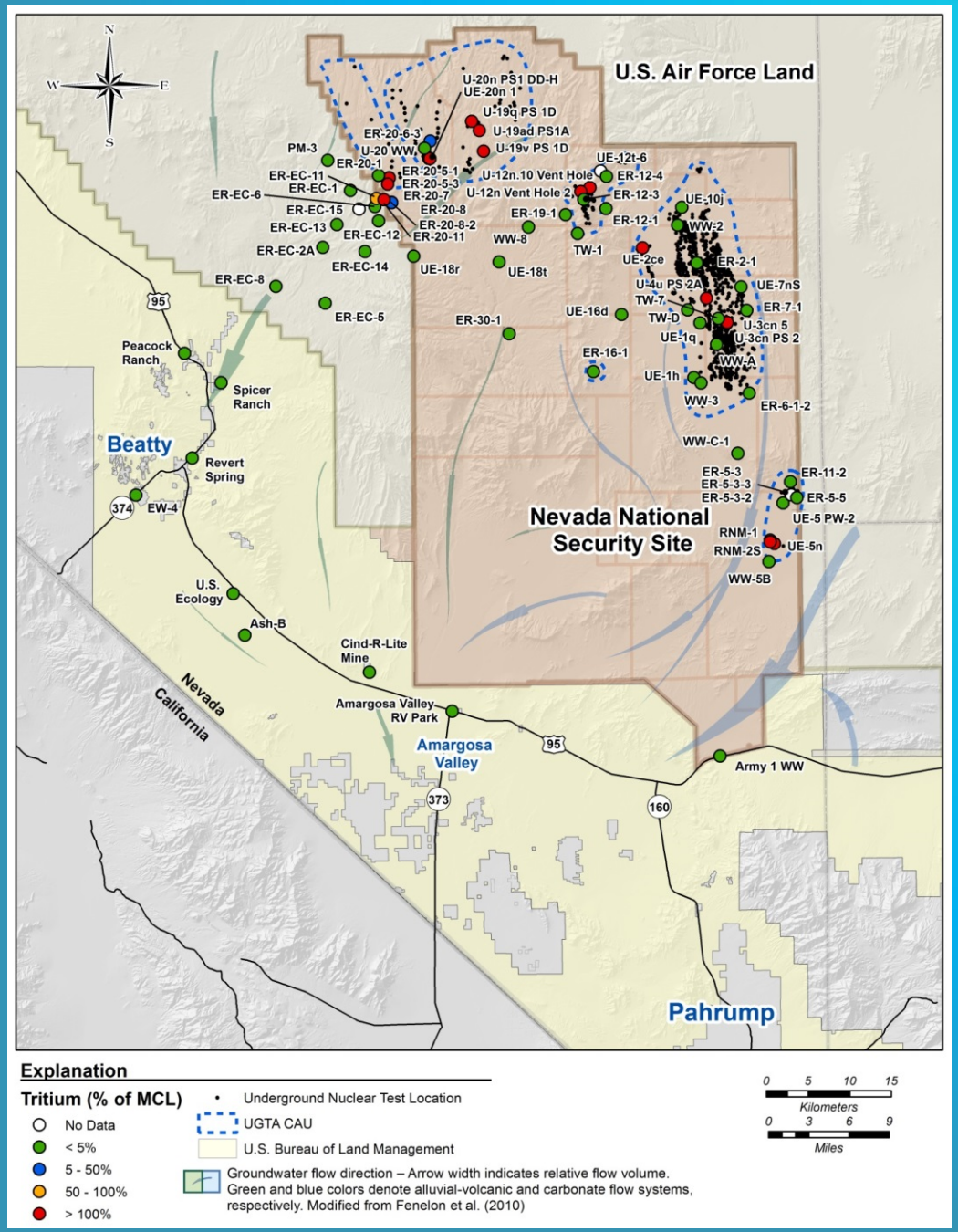
- Nye County is responsible for:
  - Identification of sampling locations (will consider input from the Community Environmental Monitors [CEMs])
  - Developing sampling plans and procedures – ensures systematic, consistent sampling methodology
  - Collection of water samples
  - Obtaining tritium analysis though independent laboratories certified by the State of Nevada
  - Checking the data to ensure quality
  - Providing sampling methodology, data, and quality check results to DOE for inclusion in the Annual NNSS Site Environmental Report
- Fact sheets, brochures or handouts
- Local government awareness
- Public meetings and community events
- Engage the CEMs to ensure public's perspective is represented
- Data dissemination options include publication on the Nye County website (www.nyecounty.com) and/or continued publication on DRI's CEMP website (www.cemp.dri.edu)

CEMP Stations and Focus Area

- Map at right shows CEMP stations (6/26/18) (www.cemp.dri.edu)
- Regional groundwater flow direction is predominantly north to south
- Downgradient areas outlined in blue
- Note that we are characterizing conditions in offsite areas only

*Image from CEMP website

Locations Sampled By DOE



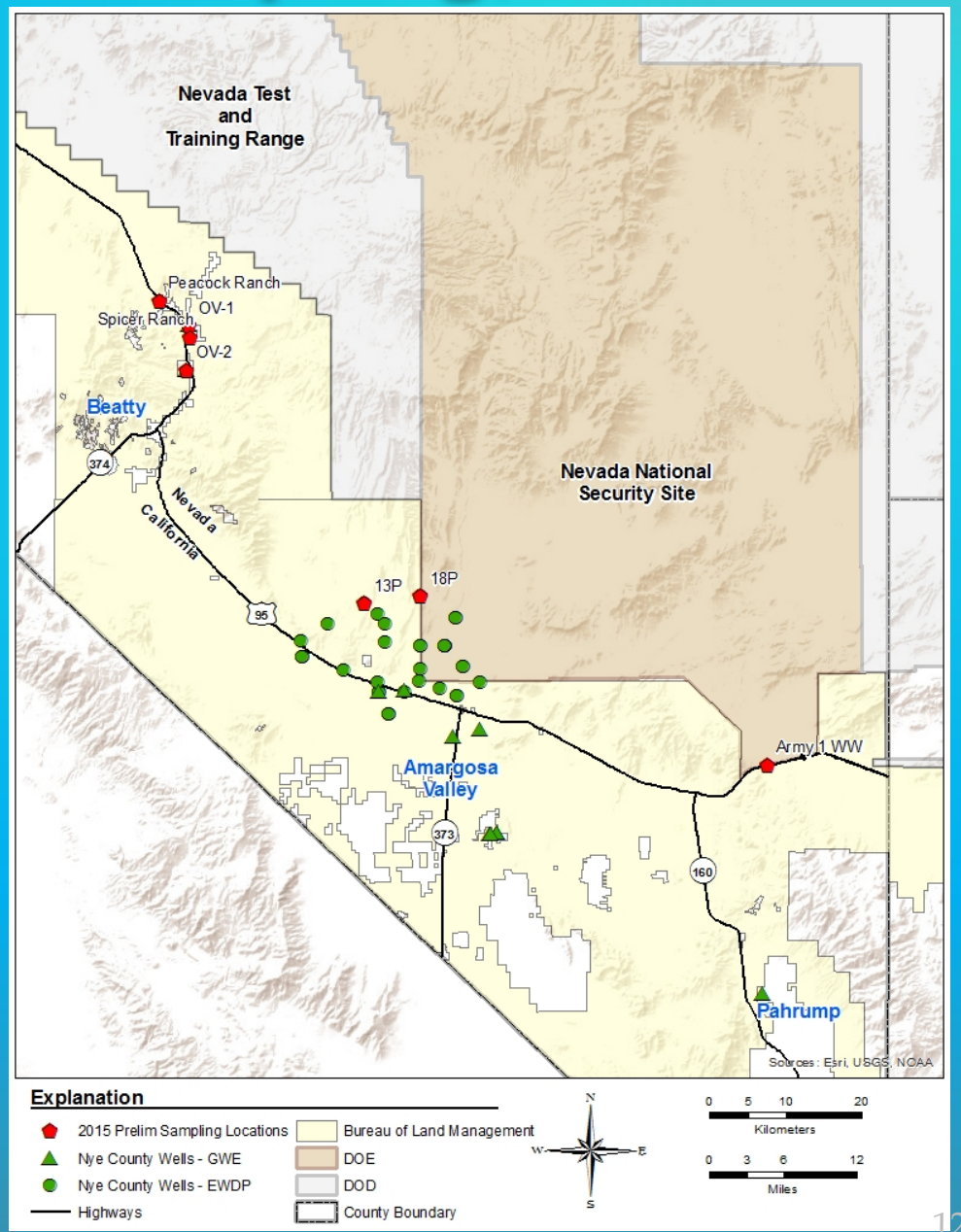
- Map shows sampled sites under the NNSS Integrated Groundwater Monitoring Program on and off the NNSS and NTTR
- Tritium results are represented as a percentage of the Maximum Contaminant Level (20,000 pCi/l, as defined by the US Environmental Protection Agency)
- Note localized variations in the groundwater flow directions
- Focus area for this study is primarily south and southwest of the NNSS and NTTR

Determining Nye County Sample Locations

- Data from the CEMP water sampling program will allow us to learn more about:
  - Quality of waters (tritium) adjacent to and downgradient from the NNSS and NTTR
  - Changes in water quality with time (tritium)
- Initial screening of candidate sites was based on the following criteria:
  - Proximity to population centers
  - Groundwater gradient (flow directions)
  - Geology/Hydrology
    - Faults
    - Rock/Soil types
  - Use results from above sources to locate candidate wells and springs
    - Availability/Access
    - Screened intervals
    - Casing type and diameter
  - Desire to broaden baseline from locations previously sampled, to include some of the wells drilled by Nye County as part of past scientific characterization programs
  - Sampled 10 locations in 2015, and 20 locations in 2016, 2017, and 2018

Nye County Identified Sampling Locations 2015 (pre-sampling)

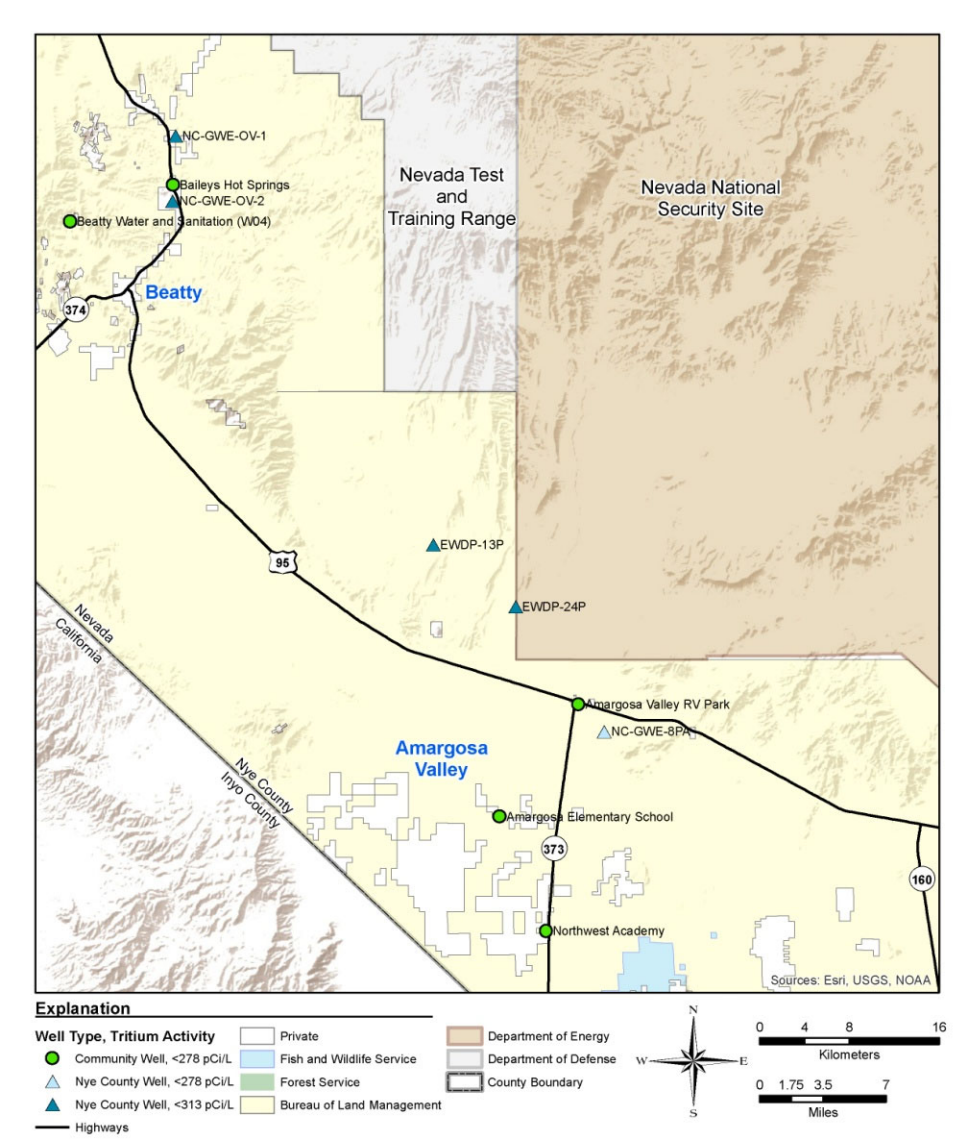
- Nye County considers the following wells to be of high sampling priority:
  - OV-1
  - OV-2
  - Spicer Ranch
  - Peacock Ranch
  - 18P (Replaced by 24P – offsite well)
  - 13P
  - Army 1 WW



2015 Sampling Results

- Established 10 core wells
  - Core wells sampled every year
  - GWE-OV-1
  - GWE-OV-2
  - EWDP-13P
  - EWDP-24P
  - GWE-8PA
  - Amargosa Elementary School
  - Amargosa Valley RV Park
  - Beatty Water and Sanitation (W04)
  - Northwest Academy
  - Baileys Hot Springs

- Test results showed all 10 wells had undetectable levels of tritium in 2015, 2016, and 2017



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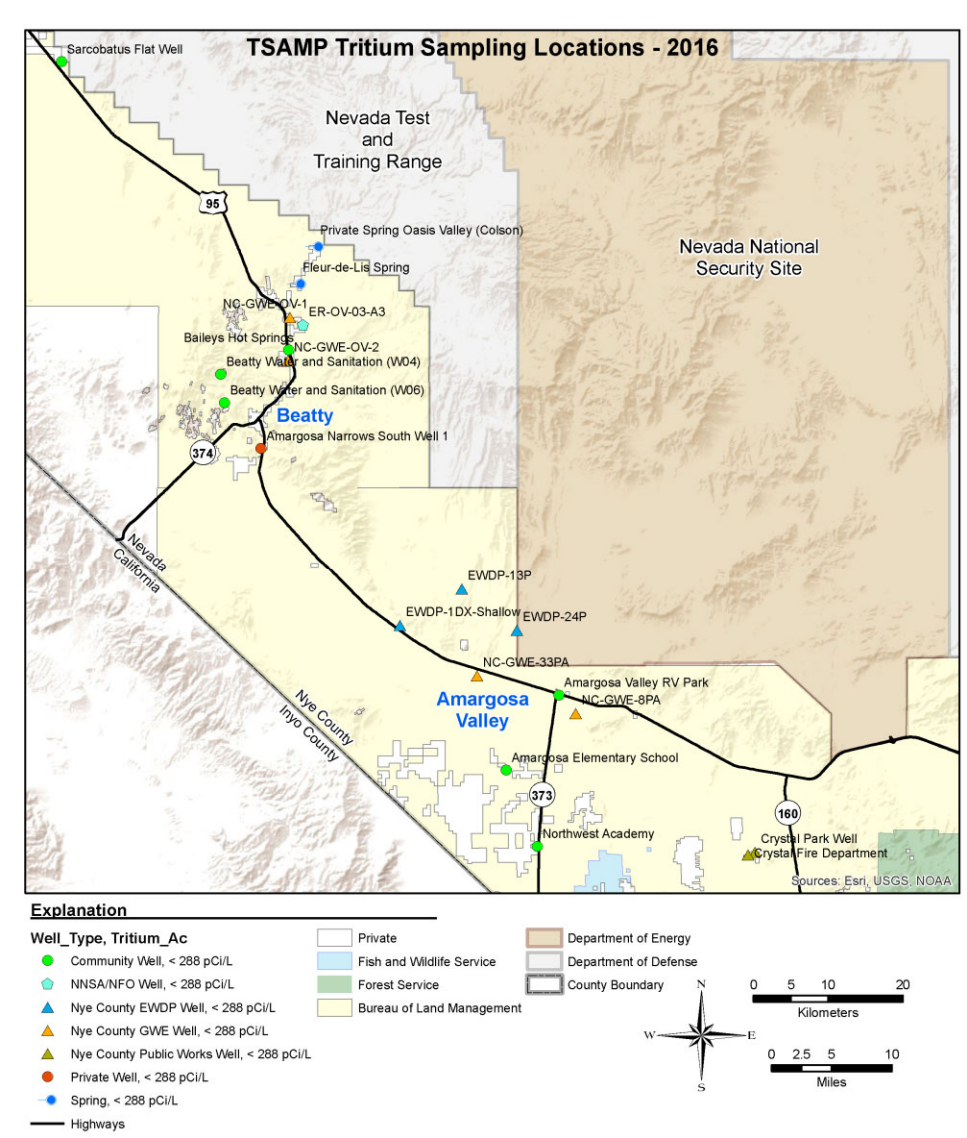

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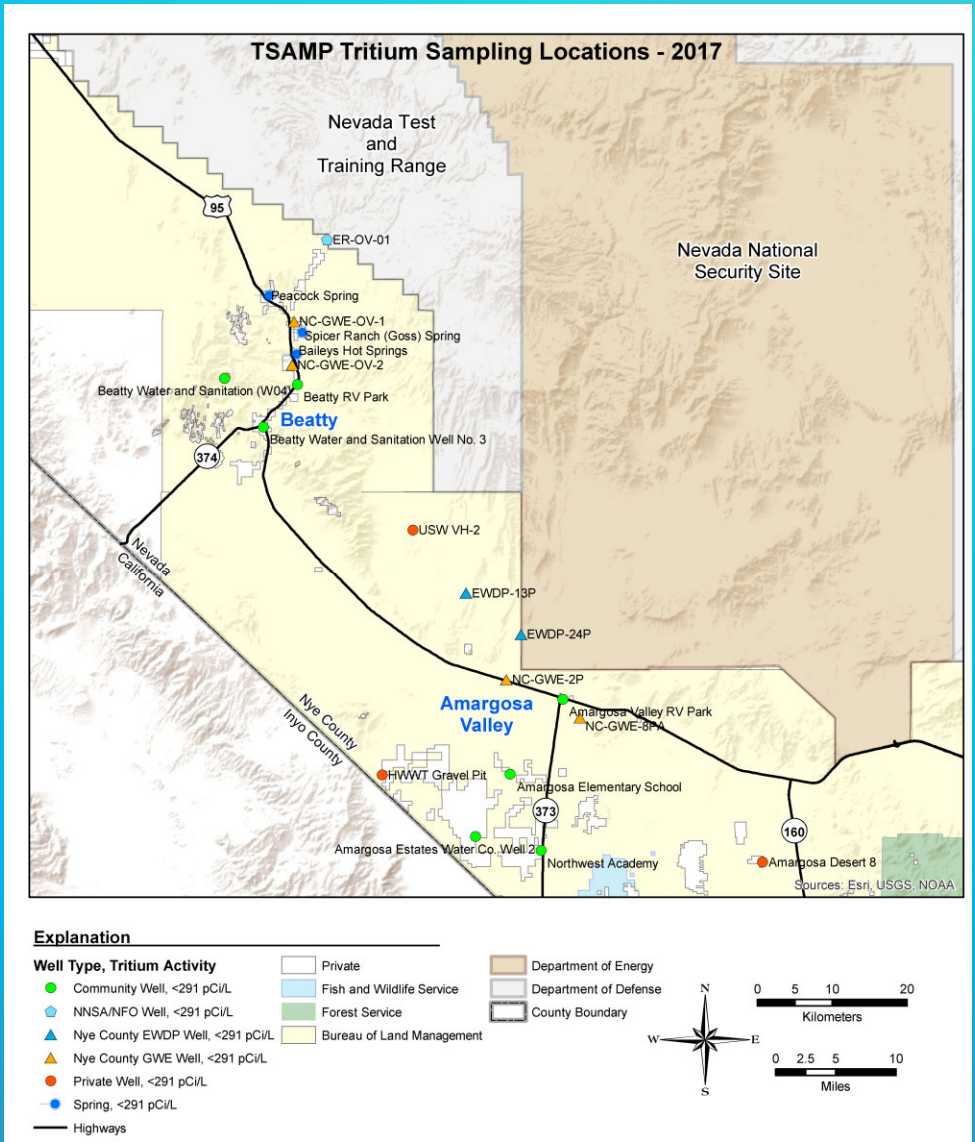

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  - Amargosa Valley Private Well-01 *
  - Bryan Spring
  - Beatty Water and Sanitation Well EW4
  - Crystal Private Well-01 *
  - ER-OV-03b
  - ER-OV-06a
  - Amargosa Valley Private Well-02-wellhead*
  - Lower Indian Spring
  - Nye Co. Station #2
  - * private well sample – new for 2018 with sequential number assigned for each area (Beatty, Amargosa, and Crystal)
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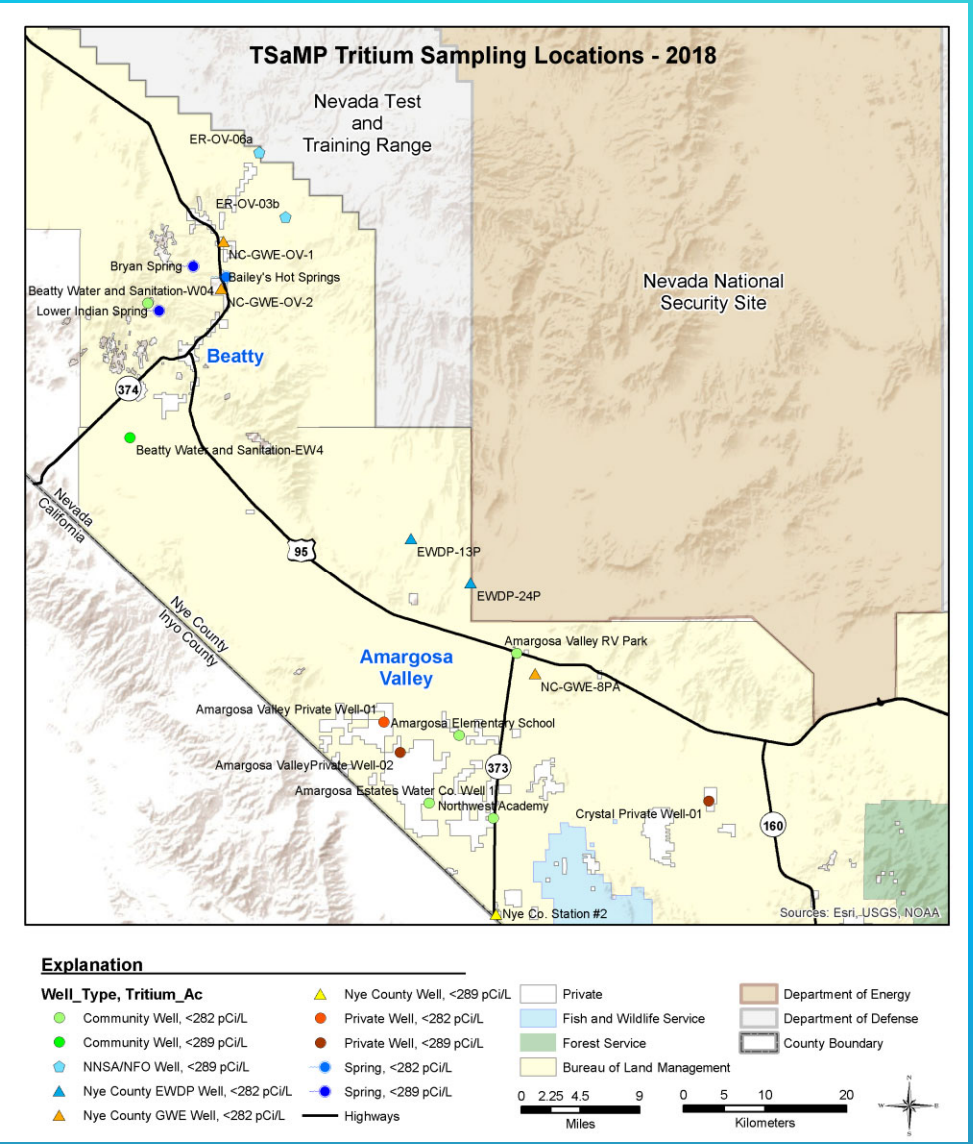

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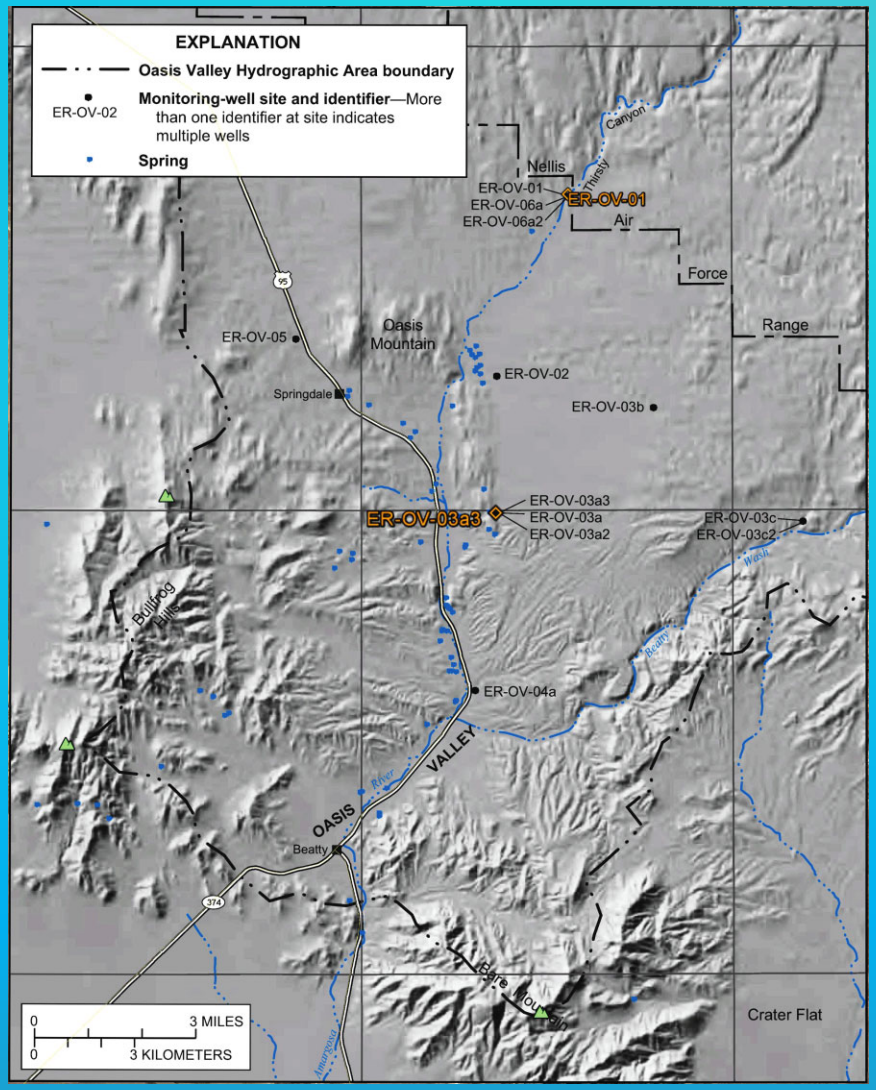

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*Pending as of 6/27/19

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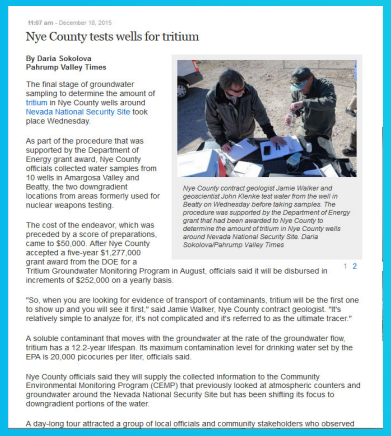

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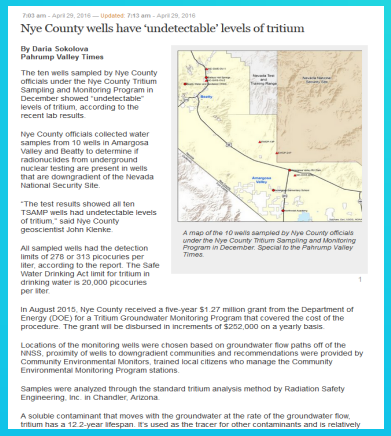

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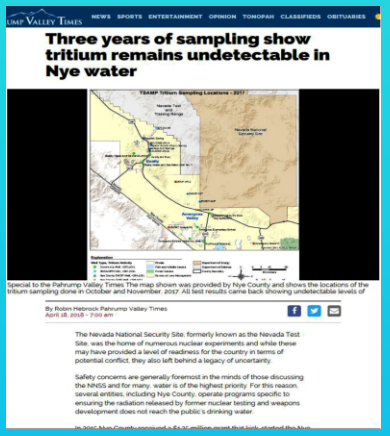
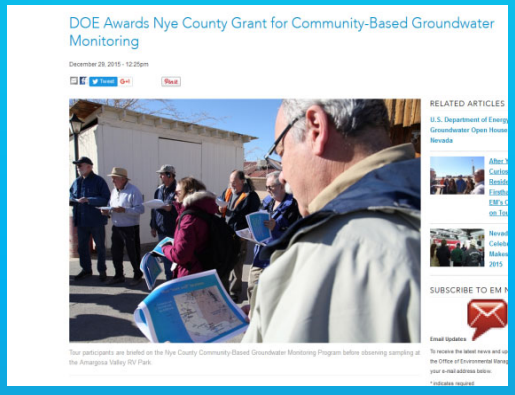


Three years of sampling show tritium remains undetectable in Nye water



DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

December 29, 2015 - 12:25pm

RELATED ARTICLES

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Quality Assurance

- Nye County coordinates sampling efforts through Quality Assurance Officer (QAO)
- Nye County conducts annual internal audits to insure integrity of TSaMP data
  - Audit conducted by qualified professional (QAO)
  - Field surveillances
  - Office surveillances
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- Since 2016, Nye County has been hosting preliminary reconnaissance fieldtrips with the DOE EM Nevada Program to insure maximum benefits will be gained from site selections

December 18, 2016

Darrell Lacy, Director
Nye County TSAMP Project Director
250 N. Hwy 160 #1
Pahrump, NV 89060

Nye County TSAMP Internal Audit Report, TSAMP-2016-01

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Regards,

Kathy Gilmore

Quality Assurance Officer

Cc: John Klenke,
Celeste Sandoval/QARC

Attachments: Audit Report and Audit Checklist

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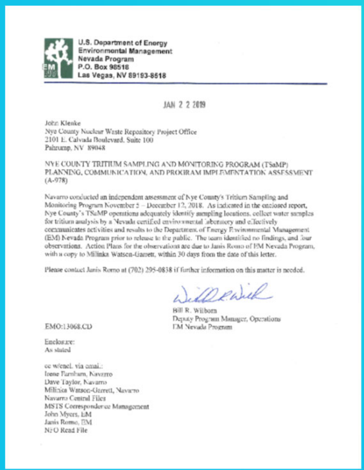
U.S. Department of Energy
Environmental Management
Nevada Program
P.O. Box 98518
Las Vegas, NV 89193-8518

JAN 2 2 2019

John Klenke
Nye County Nuclear Waste Repository Project Office
2101 E. Calvada Boulevard, Suite 100
Pahrump, NV 89048

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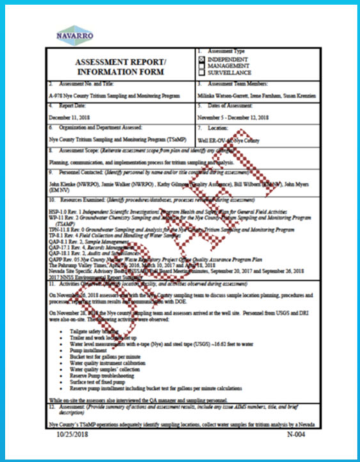
Bill R. Wilborn
Deputy Program Manager, Operations
EM Nevada Program

EMO:13068.CD

Enclosure:
As stated

cc w/encl. via email:
Irene Farnham, Navarro
Dave Taylor, Navarro
Milinka Watson-Garrett, Navarro
Navarro Central Files
MSTS Correspondence Management
John Myers, EM
Janis Romo, EM
NFO Read File


NAVARRO

ASSESSMENT REPORT/ INFORMATION FORM

Town Board Meetings

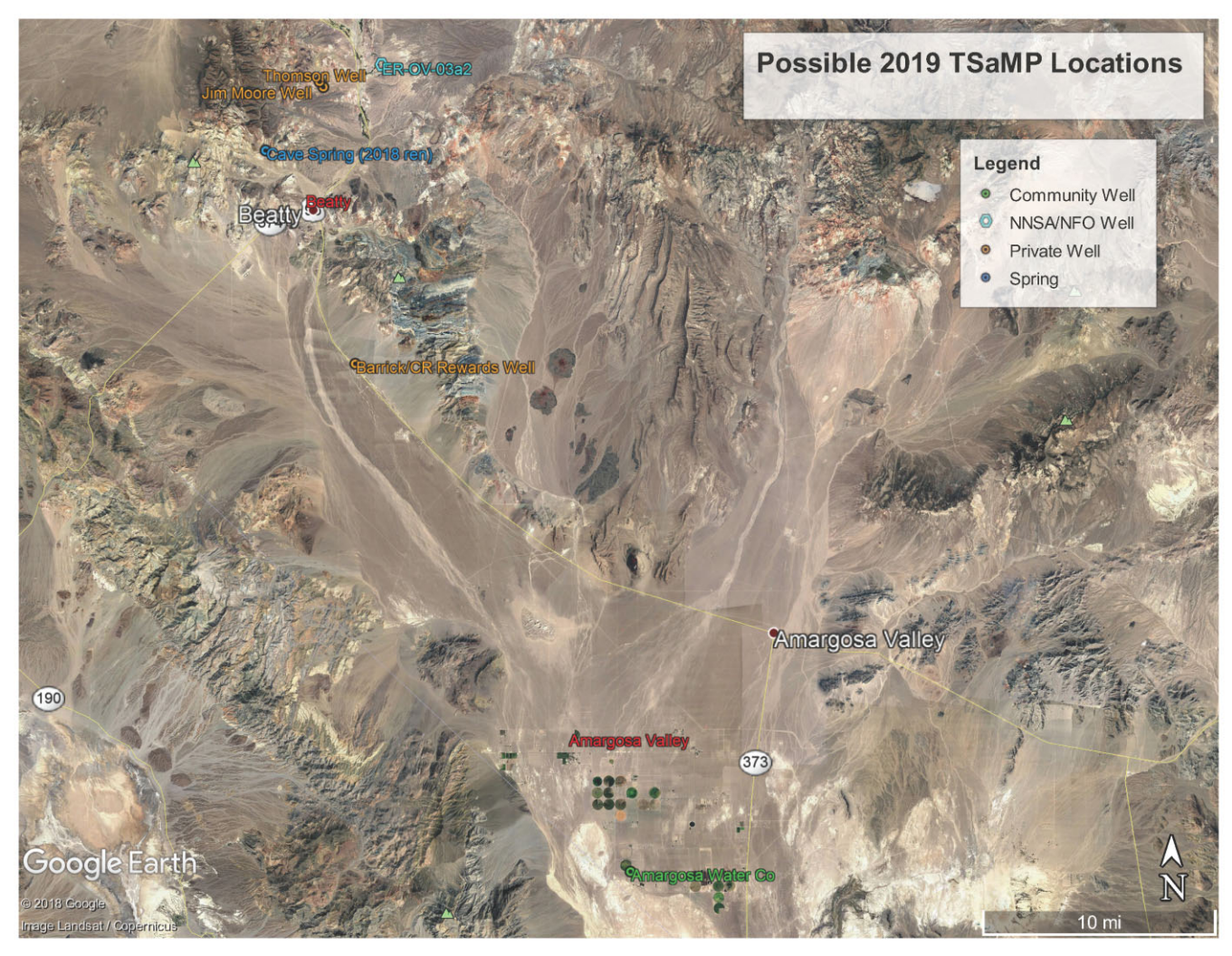
- TSaMP presentations were given at Beatty Town Board meeting 9/25/17, and Amargosa Town Board meeting 9/27/17
- Resulted in three new sampling locations for 2017, and several potential new sites for future years.
- Nye County would like to present again at both Town Board meetings in September of 2019

Additional Sampling Locations

- For discussion at the breakout session:
  - What are the priorities for well sampling locations?
    - Wells used by communities?
    - Wells that provide early detection but may not be potable water sources?
  - What wells or other locations do CEMs consider to be of highest priority?
  - What locations do you feel should be sampled?
    - 2019
    - In future years (2020 and 2021)
  - When making your recommendations, please consider:
    - Past sampling results
      - Tritium hits and flow paths
      - Age of water (Tritium half-life = 12.32 yrs – less than 1% in 7 half-lives (86 yrs)
  - Would you like to participate in the water sampling? We welcome any participation!

Possible Sampling Locations for 2019

- Six possible sampling locations to consider for 2019 and/or future years
- Need 10 locations for 2019
- What wells or other locations do CEM's consider to be of highest priority?



Future Years

- Nye County has received a 2-year no cost grant extension (to Aug 2022)
- We would like to continue working with the CEMs through face-to-face meetings, community events, and other opportunities to identify locations of interest for sampling
- We need your help to ensure data are collected in the areas of greatest concern for the communities!

Acknowledgements

- Nye County would like to thank the Department of Energy (NNSA/NFO) and the Desert Research Institute for the opportunity to be affiliated with the CEMP

Questions ?

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM 2020 UPDATE

Nye County Nuclear Waste Repository Project Office
John Klenke
July 21, 2020

MATERIAL IN THE FOLLOWING PRESENTATION SOLELY REPRESENTS THE VIEW POINT OF THE AUTHOR AND DOES NOT REPRESENT DRI OR DOE.

Overview

- Background
- Land Status
- Population
- Responsibilities
- CEMP Stations and Focus Area
- Locations Sampled by DOE
- Determining Nye County Sample Locations
- Core Well Sampling Results (2015-2019)
- Sampling Results (2016 - 2019)
- ER-OV Wells
- Public Outreach
- Quality Assurance
- Town Board Meetings
- Possible Sampling Locations for 2020 - 2021

Background – Why Are We Here?

- Nye County has the duty to protect the health and safety of citizens
- Through its Nuclear Waste Repository Project Office (NWRPO), Nye County conducted scientific characterization of the area between Yucca Mountain and the Town of Amargosa
  - Drilled and completed approximately 50 wells
  - Conducted numerous aquifer and tracer tests, geophysical surveys, water level measurements, and other specialized testing
  - Data provided to Department of Energy (DOE)
- Tritium from former weapons tests has been observed migrating on and off the NNSS
  - Offsite migration is only located on federally- controlled land and below the SDWA standards.
- Currently in a seven-year grant with DOE to conduct tritium sampling and analysis at locations downgradient from areas formerly used for nuclear weapons testing *

  * 2-year no cost extension approved by DOE (to 8/16/2022)

Land Status

- Nye County encompasses 18,199 mi^2
  - Largest county (by area) in the state, and the third-largest in contiguous US.
- Approximately 98% of land in Nye County is federally controlled
  - Bureau of Land Management
  - US Forest Service
  - Department of Defense
  - Department of Energy
- Nevada National Security Site (NNSS; formerly the Nevada Test Site) is entirely within Nye County; part of the Nevada Test and Training Range (NTTR) lies within Nye County
- Nye County population of 44,202 (2017 - U.S. Census Bureau)

Population

Pahrump:

- Approximately 26 miles south from NNSS
- Population of 38,000 people (2012)
- Estimated 73,000 people by 2060 (at 1.5% growth rate - NCWD)

Amargosa:

- Approximately 9 miles SW from the border of NNSS
- 50 mile south (downgradient) from Pahute Mesa
- Population of 1,456 (2010 census)

Population - cont

Beatty:

- Approximately 30 miles southwest (downgradient) from Pahute Mesa
- Approximately 25 miles southwest of ER-EC-11
  - Offsite well located on the Nevada Test and Training Range
  - ER-EC-11 ; Tritium detected 2009 at 12,000 picocuries per liter (60% of EPA Safe Drinking Water Act), and re-sampled in 2017 at 18,400 (92% of EPA Safe Drinking Water Act
- Population of 1,010 people (2010 census)

Responsibilities

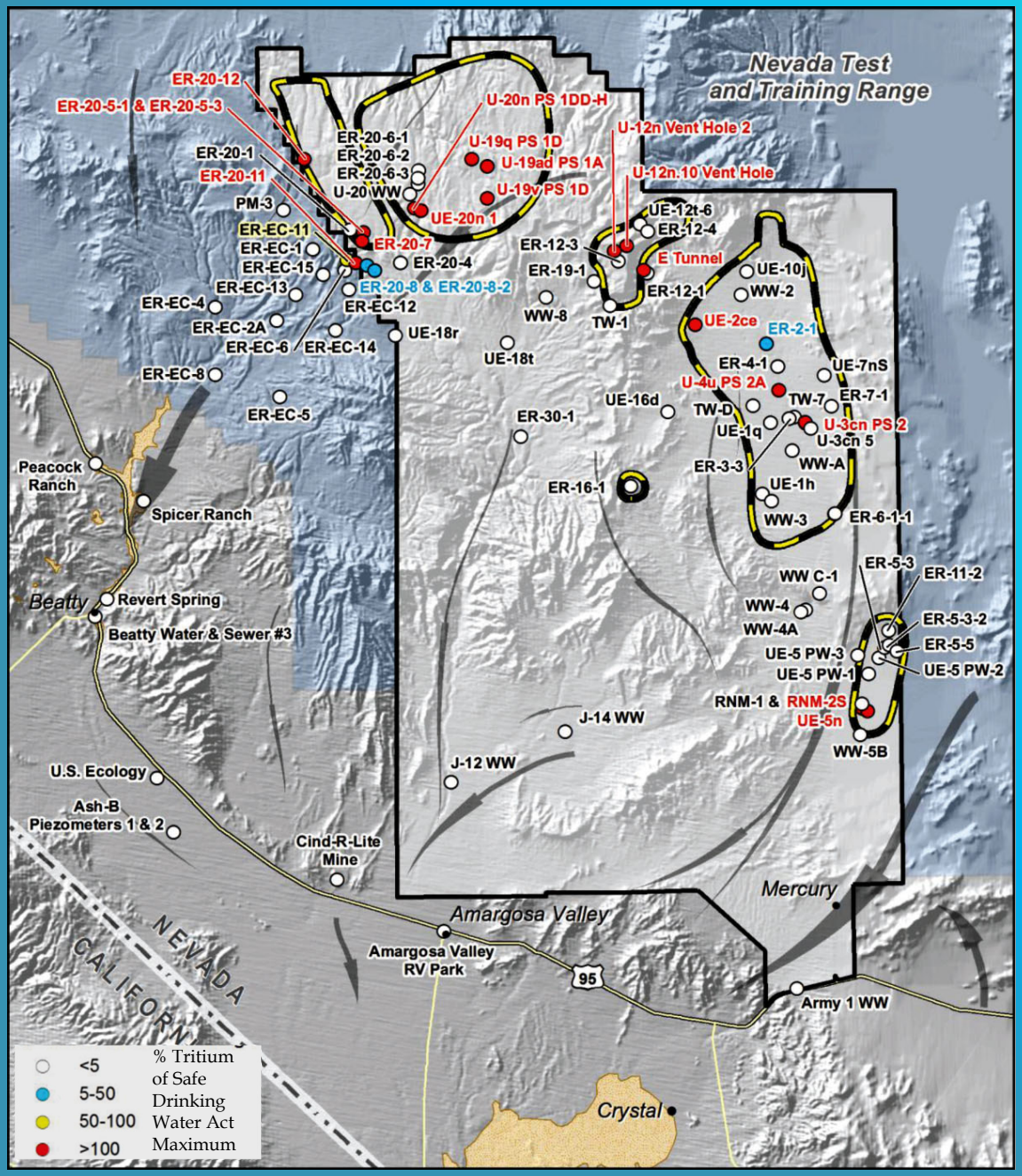
- Nye County is responsible for:
  - Identification of sampling locations (will consider input from the public)
  - Developing sampling plans and procedures – ensures systematic, consistent sampling methodology
  - Collection of water samples for tritium analysis
  - Obtaining tritium analysis though independent laboratories certified by the State of Nevada
  - Checking the data to ensure quality
  - Providing sampling methodology, data, and quality check results to DOE for inclusion in the Annual NNSS Site Environmental Report
- Fact sheets, brochures or handouts
- Local government awareness
- Public meetings and community events to ensure public's perspective is represented
- Data dissemination options include publication on the Nye County website (www.nyecounty.com) and/or continued publication on DRI's CEMP website (www.cemp.dri.edu)

CEMP Stations and Focus Area

- Map at right shows CEMP stations (6/26/18) (www.cemp.dri.edu)
- Regional groundwater flow direction is predominantly north to south
- Downgradient areas outlined in blue
- Note that we are characterizing conditions in offsite areas only

*Image from CEMP website

Locations Sampled By DOE



* Fig 5-2, Nevada National Security Site Environmental Report 2018

- Map shows sampled sites under the NNSS Integrated Groundwater Monitoring Program on and off the NNSS and NTTR
- Tritium results are represented as a percentage of the Maximum Contaminant Level (20,000 pCi/L, as defined by the US Environmental Protection Agency)
- Note localized variations in the groundwater flow directions

Determining Nye County Sample Locations

- Data from the TSaMP water sampling program has allowed us to learn more about:
  - Quality of waters (tritium) adjacent to and downgradient from the NNSS and NTTR
  - Changes in water quality with time (tritium)
- Initial screening of candidate sites was based on the following criteria:
  - Proximity to population centers
  - Groundwater gradient (flow directions)
  - Geology/Hydrology
    - Faults, Rock/Soil types
  - Used results from above sources to locate candidate wells and springs
    - Availability/Access, Screened intervals, Casing type and diameter
  - Broadened baseline from locations previously sampled, by including some of the wells drilled by Nye County as part of past scientific characterization programs

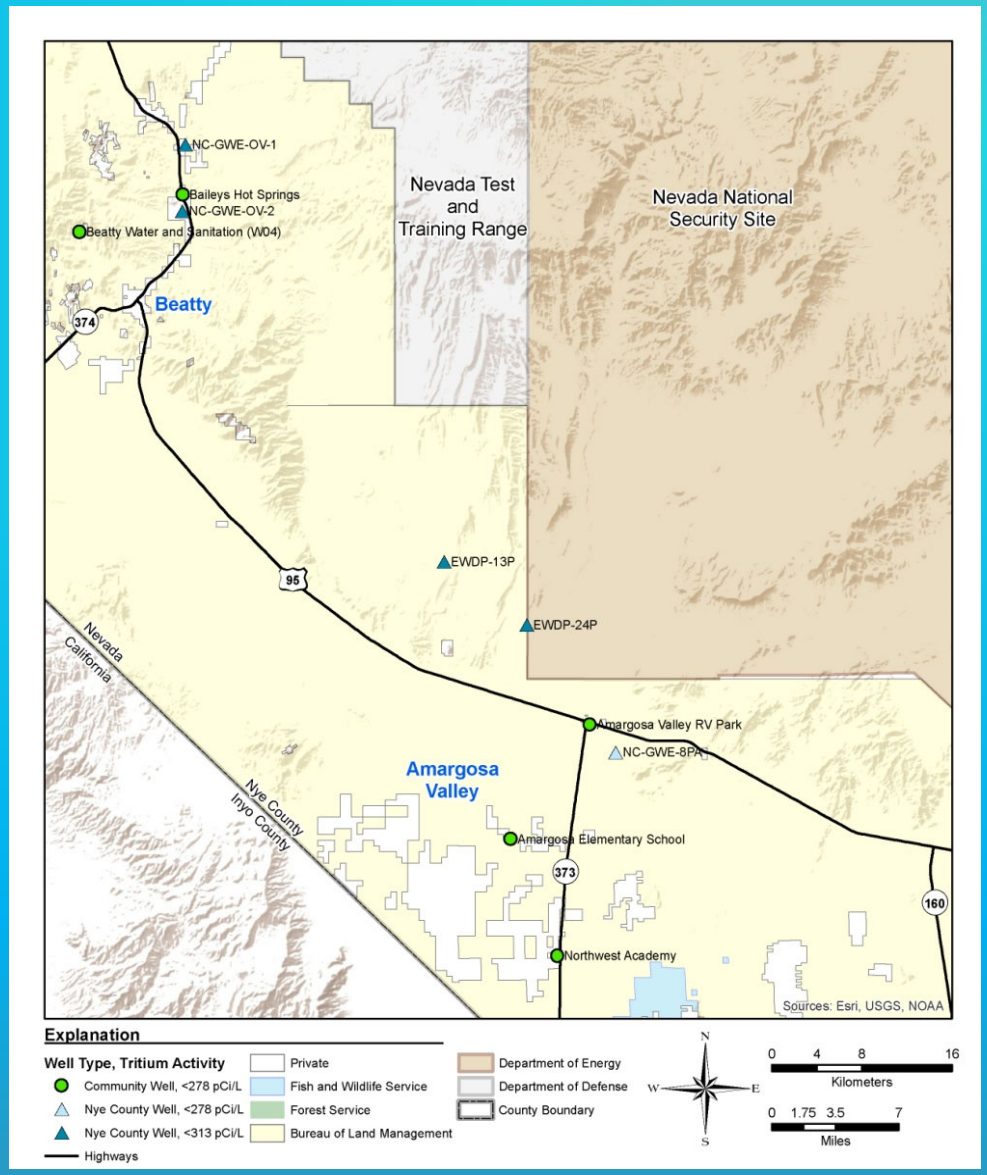
Core Well Sampling Results (2015-2019)

- Established 10 core wells in 2015
  - Core wells are sampled every year and considered to be of high sampling priority
    - Amargosa Elementary School*
    - Amargosa Valley RV Park
    - Baileys Hot Springs
    - Beatty Water and Sanitation (W04)
    - EWDP-13P
    - EWDP-24P
    - GWE-OV-1
    - GWE-OV-2
    - GWE-8PA
    - Northwest Academy**
  - Test results showed all 10 core wells had undetectable levels of tritium in 2015 - 2019***

* Well abandoned and replaced by "Amargosa Elementary School-2" in 2019

** Location renamed "Never Give Up" in 2019

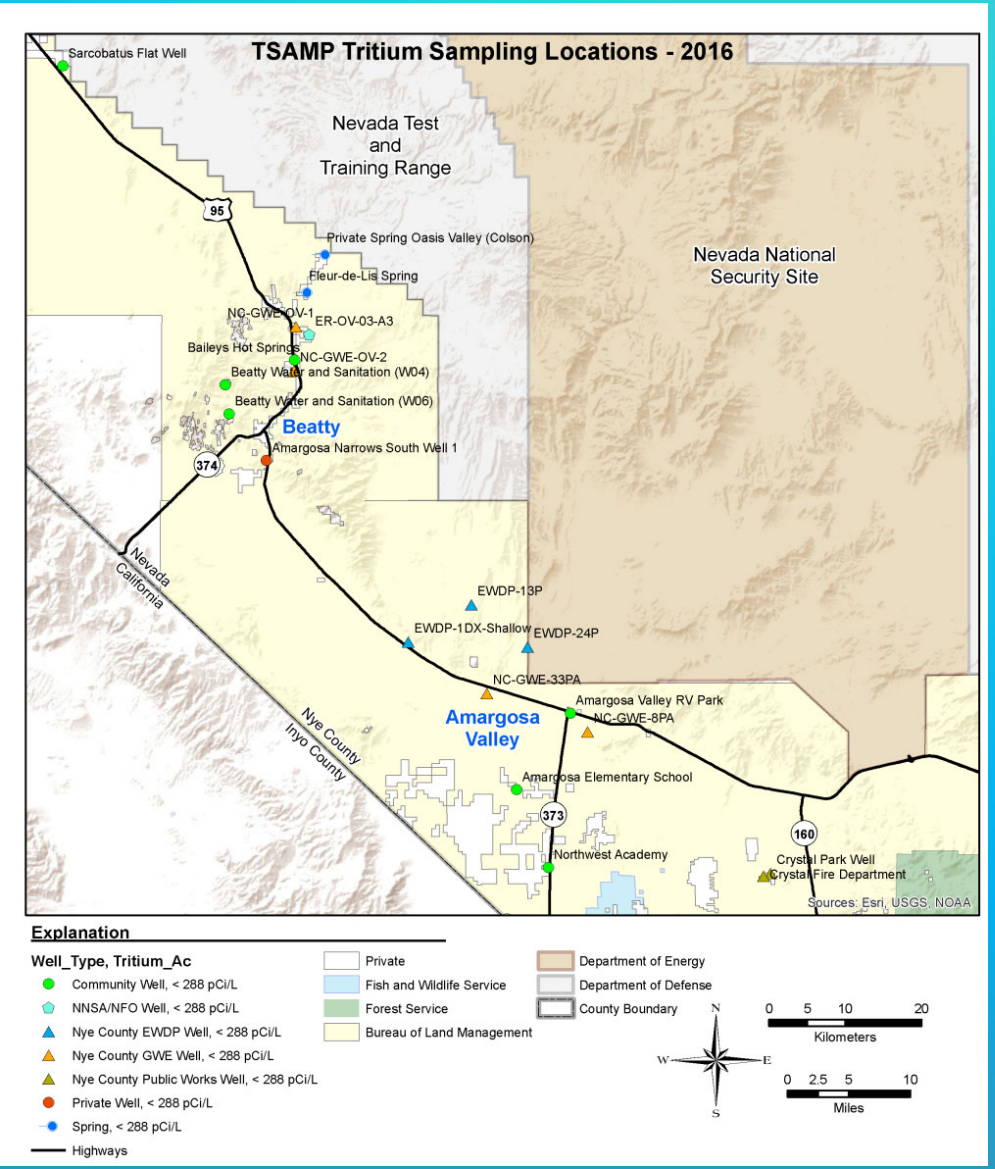
*** RSE is using EPA-approved, unenriched scintillation counting method with MDCs of approximately 300 pCi/L



2016 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Narrows South Well 1
    - Beatty Water and Sanitation (W06)
    - Crystal Fire Department
    - Crystal Park Well
    - EWDP-1DX-Shallow
    - ER-OV-03-A3 *
    - Fleur-de-Lis Spring
    - GWE-33PA
    - Private Spring Oasis Valley (Colson)
    - Sarcobatus Flat Well
  - Test results showed all 20 sample locations had undetectable levels of tritium

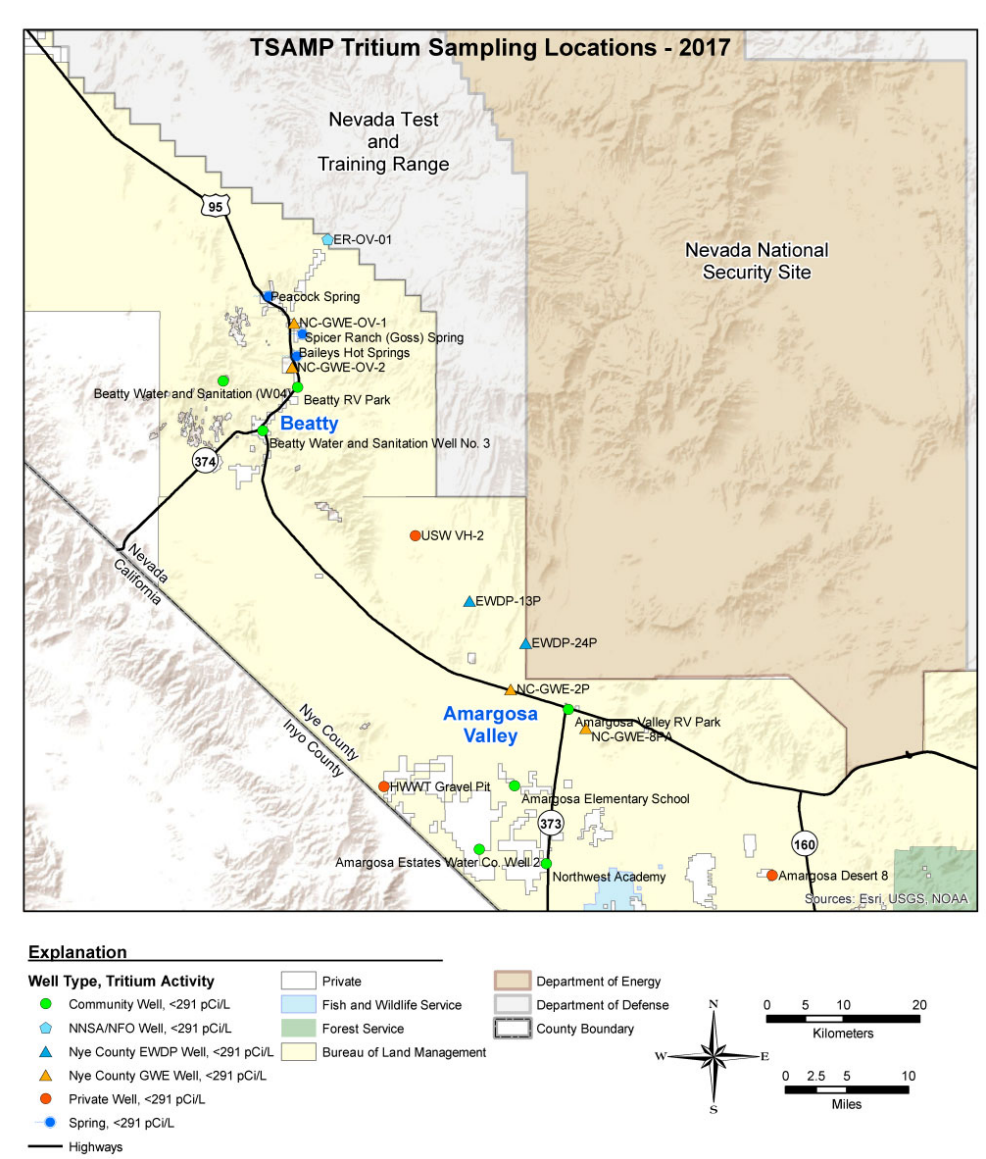
*Nye Co. started sampling ER-OV wells in 2016



2017 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Desert 8
    - Amargosa Estates Water Co. Well 2
    - Beatty RV Park
    - Beatty Water and Sanitation Well No. 3*
    - ER-OV-01
    - HWWT Gravel Pit
    - NC-GWE-2P
    - Peacock Spring*
    - Spicer Ranch (Goss) Spring
    - USW VH-2
  - Test results showed all 20 sample locations had undetectable levels of tritium

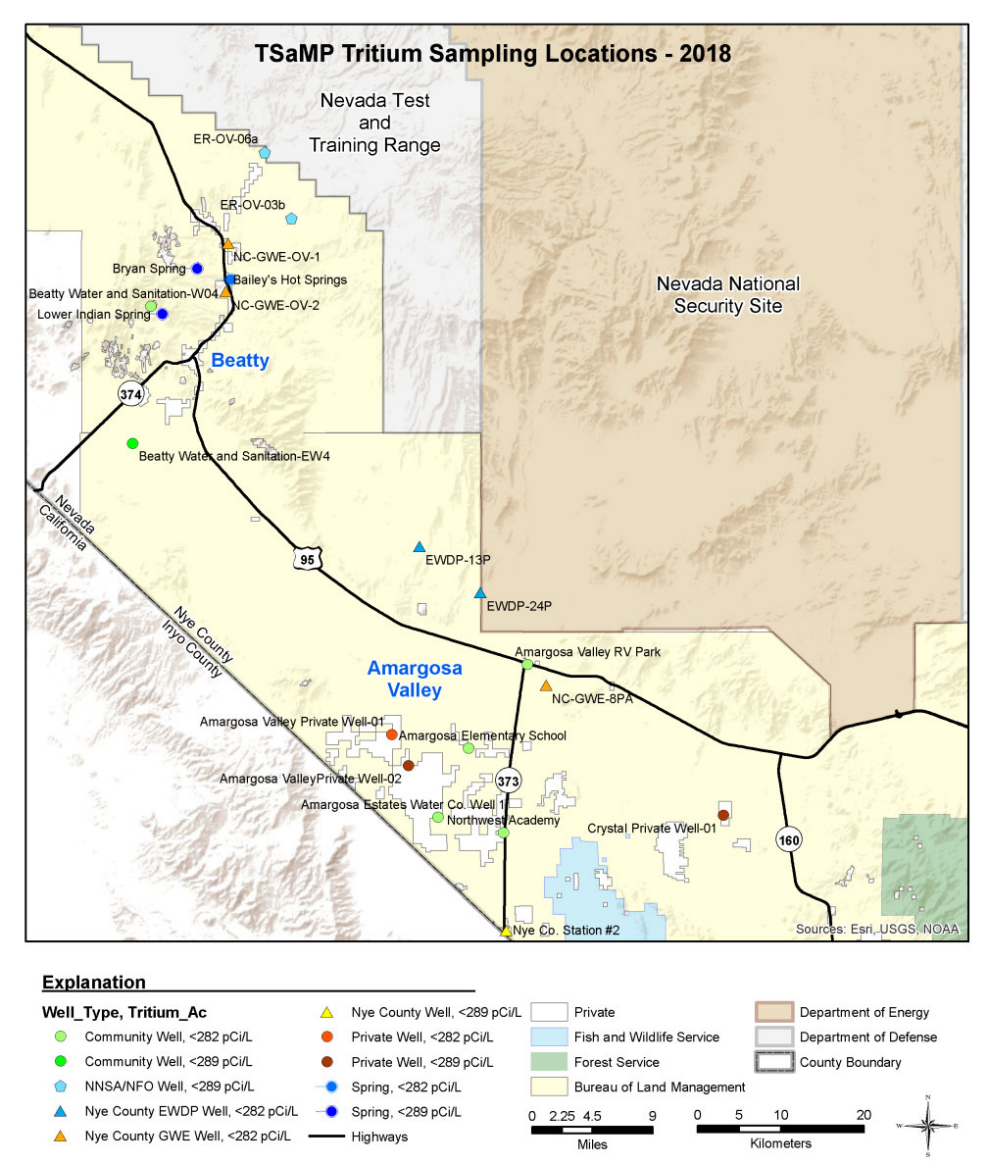
* joint sampling effort with NSTec Ecological & Environmental Monitoring



2018 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Estates Water Co. Well 1
    - Amargosa Valley Private Well-01 *
    - Amargosa Valley Private Well-02-wellhead*
    - Beatty Water and Sanitation Well EW4
    - Bryan Spring
    - Crystal Private Well-01 *
    - ER-OV-03b
    - ER-OV-06a
    - Lower Indian Spring
    - Nye Co. Station #2
  - Test results showed all 20 sample locations had undetectable levels of tritium

* private well sample – new for 2018 with sequential number assigned for each area (Beatty, Amargosa, and Crystal)



2019 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-03
    - Amargosa Valley Private Well-04
    - Amargosa Valley USPS
    - Beatty Water and Sanitation Well 1
    - Cave Spring
    - ER-OV-02
    - ER-OV-03a3
    - EWDP-7S
    - NC-GWE-Felderhoff-25-1PA
    - Revert Springs*
  - Test results showed all 20 sample locations had undetectable levels of tritium

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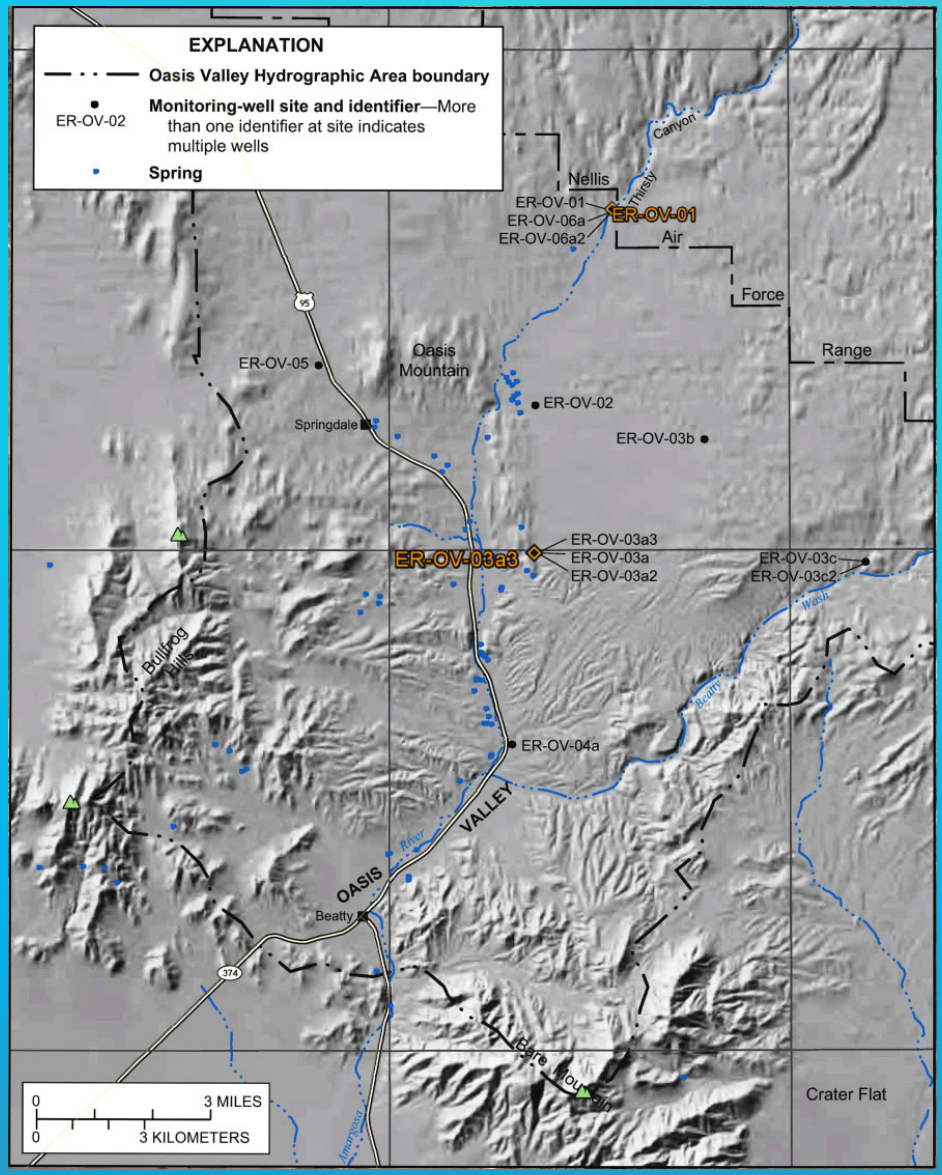
ER-OV Wells

- Adds flexibility to TSaMP program and allows for a coordinated joint sampling effort with DRI
- Nye County will continue sampling at least one ER-OV well each year

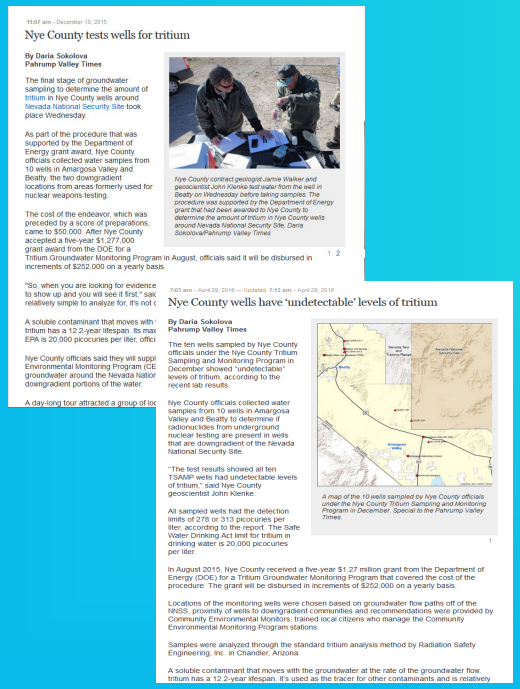


* Image from USGS WRIR 98-4184

Public Outreach

- Articles run in local newspaper (PVT) summarizing results of sampling for 2015, 2016, 2017, and 2018
- Supplied sampling locations and results for inclusion in NNSSER's - 2015, 2016, 2017, 2018, and 2019*
- Presented poster of TSaMP results at DOE Groundwater Open House meetings in Amargosa- July 29, 2016 and October 17, 2019
- Tour for the NSSAB and CEM's (Dec 16th 2015)

  * Report in progress



Nye County tests wells for tritium

By Daria Sokolova
Pahrump Valley Times

The final stage of groundwater sampling to determine the amount of tritium in Nye County wells around Nevada National Security Site took place Wednesday.

As part of the procedure that was supported by the Department of Energy grant award, Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty, the two downgradient locations from areas formerly used for nuclear weapons testing.

The cost of the endeavor, which was preceded by a score of preparations, came to $50,000. After Nye County accepted a five-year $1,277,000 grant award from the DOE for a Tritium Groundwater Monitoring Program in August, officials said it will be disbursed in increments of $252,000 on a yearly basis.

"So, when you are looking for evidence to show up and you will see it first," said relatively simple to analyze for, it's not

A soluble contaminant that moves with tritium has a 12.2-year lifespan. Its max EPA is 20,000 picocuries per liter; offici

Nye County officials said they will suppl Environmental Monitoring Program (CE groundwater around the Nevada Natior downgradient portions of the water.

A day-long tour attracted a group of loc

Nye County contract geologist Jamie Walker and geoscientist John Klenke test water from the well in Beatty on Wednesday before taking samples. The procedure was supported by the Department of Energy grant that had been awarded to Nye County to determine the amount of tritium in Nye County wells around Nevada National Security Site. Daria Sokolova/Pahrump Valley Times

1 2

Nye County wells have 'undetectable' levels of tritium

By Daria Sokolova
Pahrump Valley Times

The ten wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December showed "undetectable" levels of tritium, according to the recent lab results.

Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty to determine if radionuclides from underground nuclear testing are present in wells that are downgradient of the Nevada National Security Site.

"The test results showed all ten TSAMP wells had undetectable levels of tritium," said Nye County geoscientist John Klenke.

All sampled wells had the detection limits of 278 or 313 picocuries per liter, according to the report. The Safe Water Drinking Act limit for tritium in drinking water is 20,000 picocuries per liter.

A map of the 10 wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December. Special to the Pahrump Valley Times.

1

In August 2015, Nye County received a five-year $1.27 million grant from the Department of Energy (DOE) for a Tritium Groundwater Monitoring Program that covered the cost of the procedure. The grant will be disbursed in increments of $252,000 on a yearly basis.

Locations of the monitoring wells were chosen based on groundwater flow paths off of the NNSS, proximity of wells to downgradient communities and recommendations were provided by Community Environmental Monitors, trained local citizens who manage the Community Environmental Monitoring Program stations.

Samples were analyzed through the standard tritium analysis method by Radiation Safety Engineering, Inc. in Chandler, Arizona.

A soluble contaminant that moves with the groundwater at the rate of the groundwater flow, tritium has a 12.2-year lifespan. It's used as the tracer for other contaminants and is relatively

Three years of sampling show tritium remains undetectable in Nye water

TSAMP Tritium Sampling Locations - 2017

Special to the Pahrump Valley Times The map shown was provided by Nye County and shows the locations of the tritium sampling done in October and November 2017. All test results came back showing undetectable levels of

Sampling shows no detectable tritium in Nevada groundwater for fourth year | Pahrump V... Page 1 of 4

By Robin Hebrock Pahrump Valley Times
April 18, 2018 - 7:00 am

The Nevada National Site, was the home may have provided potential conflict th

Safety concerns are the NNSS and for m several entities, incl ensuring the radiati development does

Sampling shows no detectable tritium in Nevada groundwater for fourth year

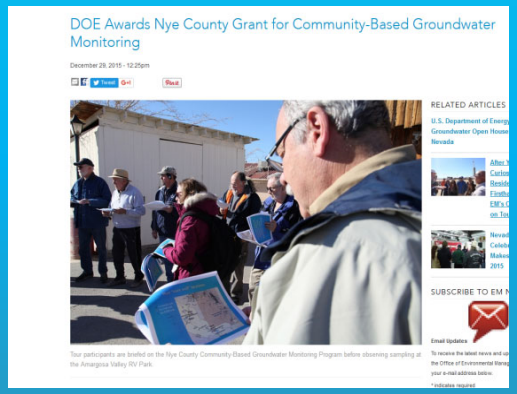
By Robin Hebrock Pahrump Valley Times
September 6, 2019 - 7:00 am

Don't miss the big stories. Like us on Facebook. Like 10K

Starting in 1951, the Nevada National Security Site, then known as the Nevada Test Site, became a nuclear testing ground in America, with both atmospheric and underground detonations taking place over a period of several decades.

While those experiments are no longer carried out, the impact of their history is still a subject of keen interest. As Nevada is the driest state in the nation, many place particular focus on the effect the

https://pvtimes.com/news/sampling-shows-no-detectable-tritium-in-nevada-groundwater-f... 10/9/2019



DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

December 29, 2015 - 12:25pm

RELATED ARTICLES

U.S. Department of Energy Groundwater Open House Nevada

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Email Updates

Tour participants are briefed on the Nye County Community-Based Groundwater Monitoring Program before observing sampling at the Amargosa Valley RV Park.

Annual Nevada National Security Site Environmental Report (NNSSER)

Cathy Wills
National Security Technologies (NSTec), Lead Author
Nevada Site Specific Advisory Board
November 19, 2014

Environmental Management
safety ❖ performance ❖ cleanup ❖ closure
www.em.doe.gov

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December 18, 2016

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Nye County TSAMP Project Director
250 N. Hwy 160 #1
Pahrump, NV 89060

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Celeste Sandoval/QARC

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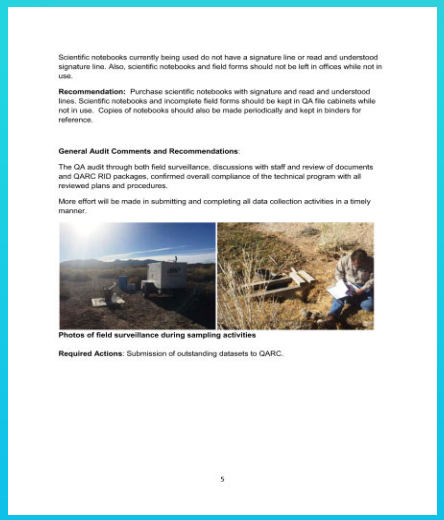

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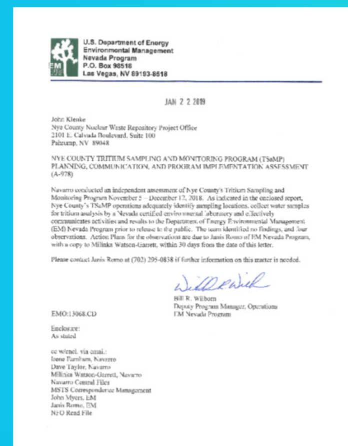
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Las Vegas, NV 89193-8518

JAN 2 2 2019

John Klenke
Nye County Nuclear Waste Repository Project Office
2101 E. Calvada Boulevard, Suite 100
Pahrump, NV 89048

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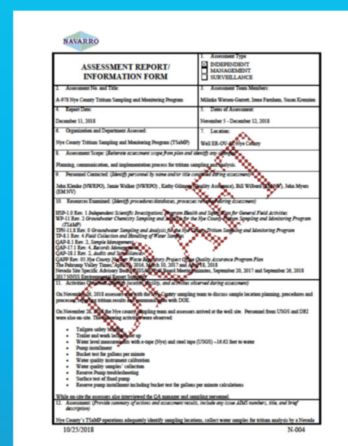
Please contact Janis Romo at (702) 295-0838 if further information on this matter is needed.

Bill R. Wilborn
Deputy Program Manager, Operations
EM Nevada Program

EMO:13068.CD

Enclosure:
As stated

cc w/encl. via email:
Irene Farnham, Navarro
Dave Taylor, Navarro
Milinka Watson-Garrett, Navarro
Navarro Central Files
MSTS Correspondence Management
John Myers, EM
Janis Romo, EM
NFO Read File


NAVARRO

ASSESSMENT REPORT/ INFORMATION FORM	1. Assessment Type ☒ INDEPENDENT ☐ MANAGEMENT ☐ SURVEILLANCE
2. Assessment No. and Title: A-978 Nye County Tritium Sampling and Monitoring Program	3. Assessment Team Members: Milinka Watson-Garrett, Irene Farnham, Susan Krenzien
4. Report Date: December 11, 2018	5. Dates of Assessment: November 5 - December 12, 2018
6. Organization and Department Assessed: Nye County Tritium Sampling and Monitoring Program (TSaMP)	7. Location: Well ER-OV-[illegible] Nye County

8. Assessment Scope: *(Reiterate assessment scope from plan and identify any changes)*

Planning, communication, and implementation process for tritium sampling and analysis.

9. Personnel Contacted: *(Identify personnel by name and/or title contacted during assessment)*

John Klenke (NWRPO), Jamie Walker (NWRPO), Kathy Gilmore (Quality Assurance), Bill Wilborn ([illegible]), John Myers (EM NV)

10. Resources Examined: *(Identify procedures/databases, processes reviewed during assessment)*

HSP-1.0 Rev. 1 *Independent Scientific Investigations Program Health and Safety Plan for General Field Activities*
WP-11 Rev. 2 *Groundwater Chemistry Sampling and Analysis for the Nye County Tritium Sampling and Monitoring Program (TSAMP)*
TPN-11.8 Rev. 0 *Groundwater Sampling and Analysis for the Nye County Tritium Sampling and Monitoring Program*
TP-8.1 Rev. 4 *Field Collection and Handling of Water Samples*
QAP-8.1 Rev. 2, *Sample Management*
QAP-17.1 Rev. 4, *Records Management*
QAP-18.1 Rev. 2, *Audits and Surveillances*
QAPP Rev. 05 *Nye County Nuclear Waste Repository Project Office Quality Assurance Program Plan*
The Pahrump Valley Times, April [illegible], 2016, March 10, 2017 and April 18, 2018
Nevada Site Specific Advisory Board (NSSAB) [illegible] Board Meeting minutes, September 20, 2017 and September 26, 2018
2017 NNSS Environmental Report Summary

11. Activities Observed: *(Identify location, facility, and activities observed during assessment)*

On November [illegible], 2018 assessors met with the Nye County sampling team to discuss sample location planning, procedures and processes, reporting tritium results and communication with DOE.

On November 28, 2018 the Nye county sampling team and assessors arrived at the well site. Personnel from USGS and DRI were also on-site. The following activities were observed:

- Tailgate safety briefing
- Trailer and work location set up
- Water level measurements with e-tape (Nye) and steel tape (USGS) ~16.62 feet to water
- Pump installment
- Bucket test for gallons per minute
- Water quality instrument calibration
- Water quality samples' collection
- Reserve Pump troubleshooting
- Surface test of fixed pump
- Reserve pump installment including bucket test for gallons per minute calculations

While on-site the assessors also interviewed the QA manager and sampling personnel.

12. Assessment: *(Provide summary of actions and assessment results, include any issue AIMS numbers, title, and brief description)*

Nye County's TSaMP operations adequately identify sampling locations, collect water samples for tritium analysis by a Nevada

10/25/2018 N-004

DRAFT

Town Board Meetings

- TSaMP presentations were given at Beatty Town Board meetings on 9/25/17, and 11/4/19; and at Amargosa Town Board meetings on 9/27/17, and 11/21/19
- 2017 presentations resulted in three new sampling locations for 2017, and several potential new sites for future years.
- 2019 presentations resulted in eight potential new sites for future years.

Possible Sampling Locations 2020-2021

- What are the priorities for well sampling locations?
  - Wells used by communities?
  - Wells that provide early detection but may not be potable water sources?
- What wells or other locations do members of public consider to be of highest priority?
- What locations do you feel should be sampled?
  - 2020 - 2021
- When making your individual recommendation, please consider:
  - Past sampling results
    - Identified flow paths and historic sampling results
    - Age of water (Tritium half-life = 12.32 yrs – less than 1% remaining after 7 half-lives (86 yrs)
- Would you like to participate in the water sampling?
- We welcome any participation!

Questions?


Colson Pond, Oasis Valley

Contact Information:
John Klenke
Geoscientist III
jklenke@co.nye.nv.us
Office: 775-727-3494

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM 2021 UPDATE

Nye County Natural Resources and Federal Facilities Office
John Klenke
July 27, 2021

MATERIAL IN THE FOLLOWING PRESENTATION SOLELY REPRESENTS THE VIEW POINT OF THE AUTHOR AND DOES NOT REPRESENT DRI OR DOE.

Overview

- Background
- Land Status
- Population
- Responsibilities
- CEMP Stations and Focus Area
- Locations Sampled by DOE
- Determining Nye County Sample Locations
- Core Well Sampling Results (2015-2020)
- Sampling Results (2016 - 2020)
- ER-OV Wells
- Public Outreach
- Quality Assurance
- Town Board Meetings
- Possible Sampling Locations for 2021

Background – Why Are We Here?

- Nye County has the duty to protect the health and safety of citizens
- Through its Nuclear Waste Repository Project Office (NWRPO), Nye County conducted scientific characterization of the area between Yucca Mountain and the Town of Amargosa
  - Drilled and completed approximately 50 wells
  - Conducted numerous aquifer and tracer tests, geophysical surveys, water level measurements, and other specialized testing
  - Data provided to Department of Energy (DOE)
- Tritium from former weapons tests has been observed migrating on and off the NNSS
  - Offsite migration is only located on federally- controlled land and below the SWDA standards.
- Currently in a seven-year grant with DOE to conduct tritium sampling and analysis at locations downgradient from areas formerly used for nuclear weapons testing

Land Status

- Nye County encompasses 18,199 mi^2
  - Largest county (by area) in the state, and the third-largest in contiguous US.
- Approximately 98% of land in Nye County is federally controlled
  - Bureau of Land Management
  - US Forest Service
  - Department of Defense
  - Department of Energy
- Nevada National Security Site (NNSS; formerly the Nevada Test Site) is entirely within Nye County
- Part of the Nevada Test and Training Range (NTTR) lies within Nye County
- Nye County population of 46,523 (Census Bureau. 2019)

Population

Pahrump:

- Approximately 26 miles south from NNSS
- Population of 37,298 people (ACS 2019)
- Estimated 88,314 people by 2060 (at 1.5% growth rate – NCWRP update 2017)

Amargosa:

- Approximately 9 miles SW from the border of NNSS
- 50 mile south (downgradient) from Pahute Mesa
- Population of 1,435 (ACS 2019)

Population – cont

Beatty:

- Approximately 30 miles southwest (downgradient) from Pahute Mesa
- Approximately 25 miles southwest of well ER-EC-11*

  * ER-EC-11 is located downgradient of Pahute Mesa, off of the NNSS and on the Nevada Test and Training Range. Tritium was detected in ER-EC-11 in 2009 at 12,000 picocuries per liter (pCi/L), or 60% of EPA's Safe Drinking Water Act (SWDA). When re-sampled in 2017, levels had increased to 18,400 pCi/L, or to 92% of the SWDA.

- Population of 804 people (ACS 2019)

Responsibilities

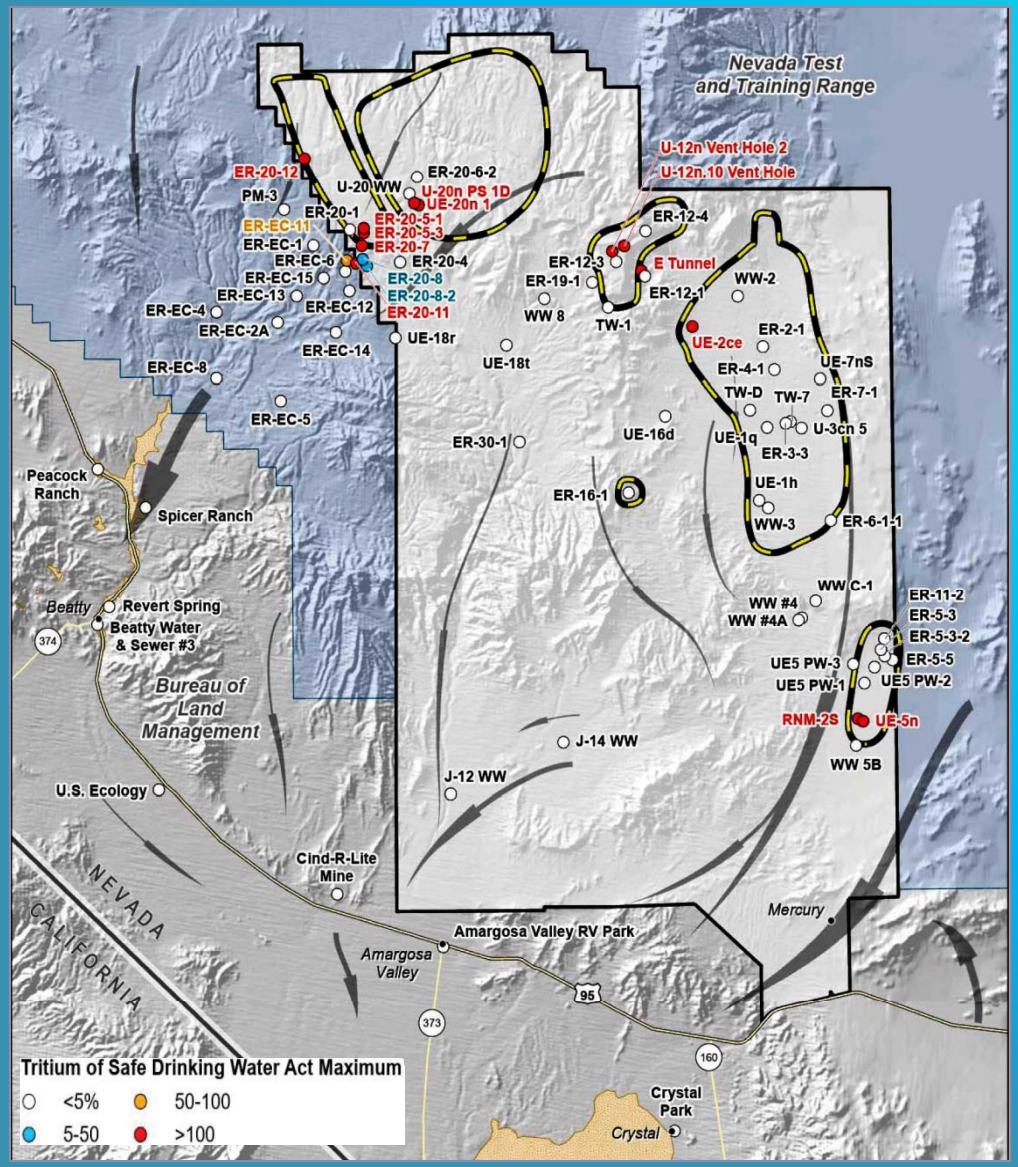
- Nye County is responsible for:
  - Identification of sampling locations (will consider input from the public)
  - Developing sampling plans and procedures – ensures systematic, consistent sampling methodology
  - Collection of water samples for tritium analysis
  - Obtaining tritium analysis though independent laboratories certified by the State of Nevada
  - Checking the data to ensure quality
  - Providing sampling methodology, data, and quality check results to DOE for inclusion in the Annual NNSS Site Environmental Report
- Fact sheets, brochures or handouts
- Local government awareness
- Public meetings and community events to ensure public's perspective is represented
- Data dissemination options include publication on the Nye County website (www.nyecounty.net) and/or continued publication on DRI's CEMP website (www.cemp.dri.edu)

CEMP Stations and Focus Area

- Map at right shows CEMP stations (6/26/18) (www.cemp.dri.edu)
- Regional groundwater flow direction is predominantly north to south
- Downgradient areas outlined in blue
- Note that we are characterizing conditions in offsite areas only

*Image from CEMP website

Locations Sampled By DOE EM NV (UGTA)



* Fig 5-2, Nevada National Security Site Environmental Report 2019

- Map showing sampled sites under the NNSS Integrated Groundwater Monitoring Program on and off the NNSS and NTTR
- Tritium results are represented as a percentage of the Maximum Contaminant Level (20,000 pCi/L, as defined by the US Environmental Protection Agency)
- Note localized variations in the groundwater flow directions (arrows)

- DOE : United States Department Of Energy
- EM NV: Office of Environmental Management - Nevada Program
- NNSS: Nevada National Security Site (1360 square miles, DOE)
- NTTR: Nevada Test and Training Range (4531 square miles, Department of Defense)
- UGTA: Underground Test Area program

Determining Nye County Sample Locations

- Data from the TSaMP water sampling program has allowed us to learn more about:
  - Quality of waters (tritium) adjacent to and downgradient from the NNSS and NTTR
  - Changes in water quality with time (tritium)
- Initial screening of candidate sites was based on the following criteria:
  - Proximity to population centers
  - Groundwater gradient (flow directions)
  - Geology/Hydrology
    - Faults, Rock/Soil types
  - Used results from above sources to locate candidate wells and springs
    - Availability/Access, Screened intervals, Casing type and diameter
  - Broadened baseline from locations previously sampled, by including some of the wells drilled by Nye County as part of past scientific characterization programs

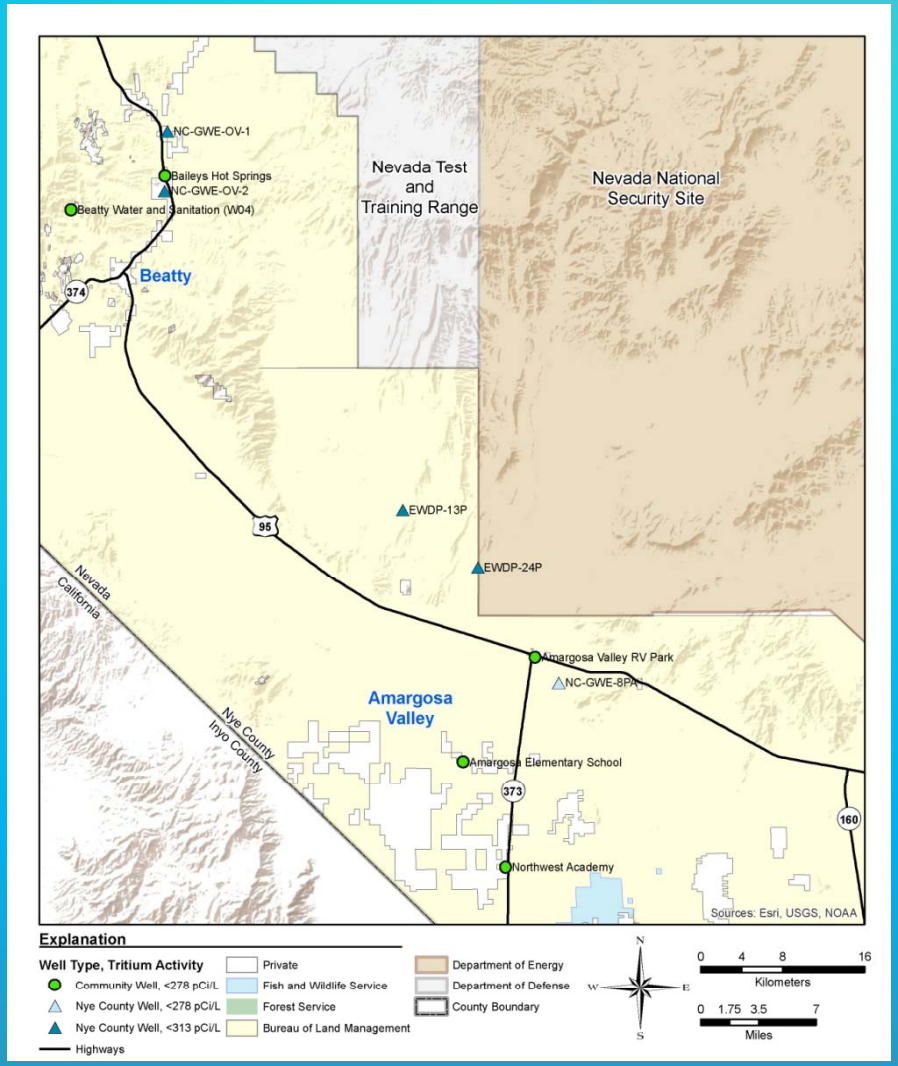
Core Well Sampling Results (2015–2020)

- Established 10 core wells in 2015
  - Core wells are sampled every year and considered to be of high sampling priority
    - Amargosa Elementary School*
    - Amargosa Valley RV Park
    - Baileys Hot Springs
    - Beatty Water and Sanitation (W04)
    - EWDP-13P
    - EWDP-24P
    - GWE-OV-1
    - GWE-OV-2
    - GWE-8PA
    - Northwest Academy**
  - Test results showed all 10 core wells had undetectable levels of tritium in 2015 - 2020***

* Well abandoned and replaced by "Amargosa Elementary School-2" in 2019

** Location renamed "Never Give Up" in 2019

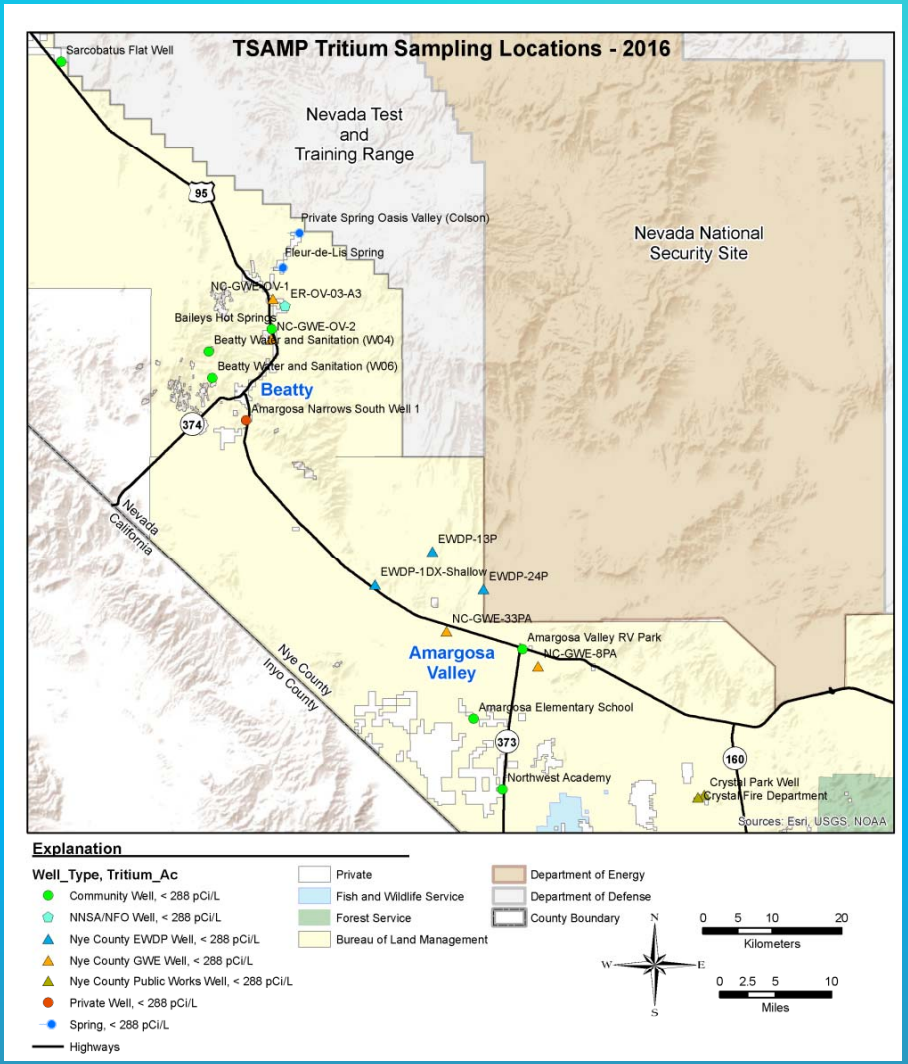
*** RSE is using EPA-approved, unenriched scintillation counting method with MDCs of approximately 300 pCi/L



2016 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Narrows South Well 1
    - Beatty Water and Sanitation (W06)
    - Crystal Fire Department
    - Crystal Park Well
    - EWDP-1DX-Shallow
    - ER-OV-03-A3 *
    - Fleur-de-Lis Spring
    - GWE-33PA
    - Private Spring Oasis Valley (Colson)
    - Sarcobatus Flat Well
  - Test results showed all 20 sample locations had undetectable levels of tritium

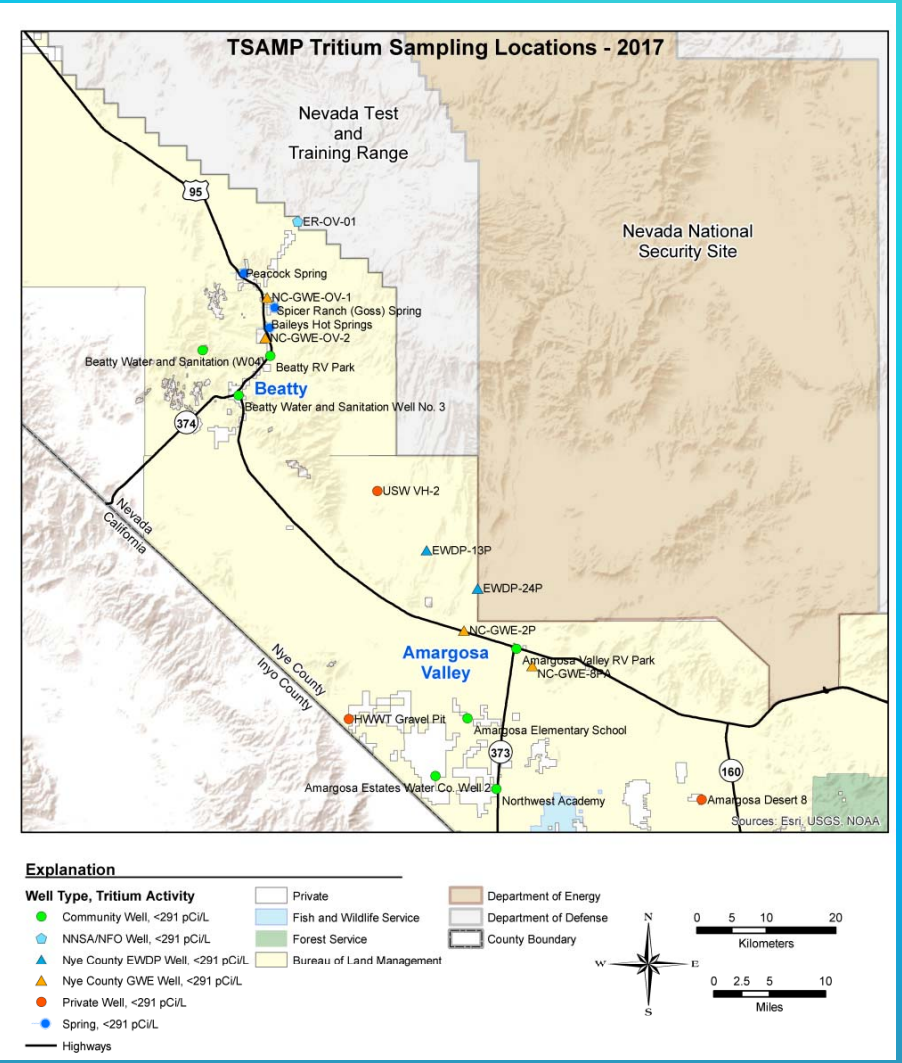
*Nye Co. started sampling ER-OV wells in 2016



2017 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Desert 8
    - Amargosa Estates Water Co. Well 2
    - Beatty RV Park
    - Beatty Water and Sanitation Well No. 3*
    - ER-OV-01
    - HWWT Gravel Pit
    - NC-GWE-2P
    - Peacock Spring*
    - Spicer Ranch (Goss) Spring
    - USW VH-2
  - Test results showed all 20 sample locations had undetectable levels of tritium

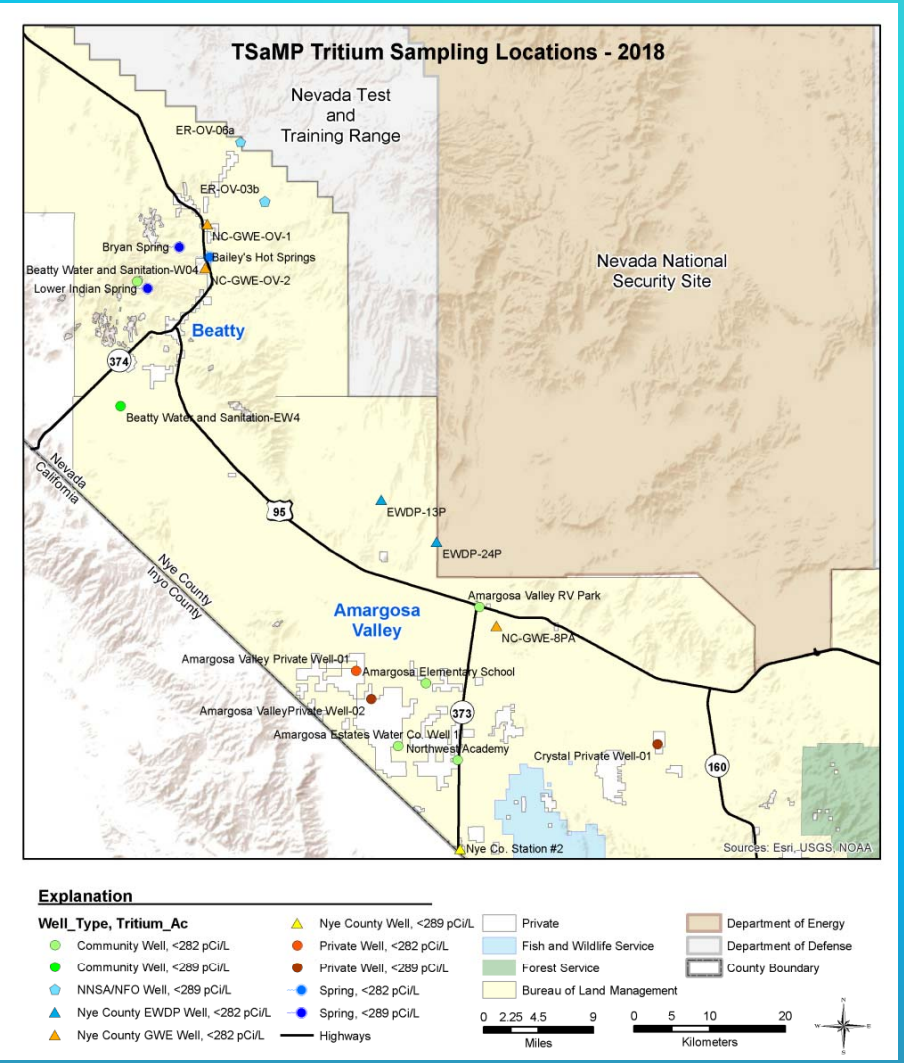
* joint sampling effort with NSTec Ecological & Environmental Monitoring



2018 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Estates Water Co. Well 1
    - Amargosa Valley Private Well-01 *
    - Amargosa Valley Private Well-02-wellhead*
    - Beatty Water and Sanitation Well EW4
    - Bryan Spring
    - Crystal Private Well-01 *
    - ER-OV-03b
    - ER-OV-06a
    - Lower Indian Spring
    - Nye Co. Station #2
  - Test results showed all 20 sample locations had undetectable levels of tritium

* private well sample – new starting in 2018 with sequential number assigned for each area (Beatty, Amargosa, and Crystal)



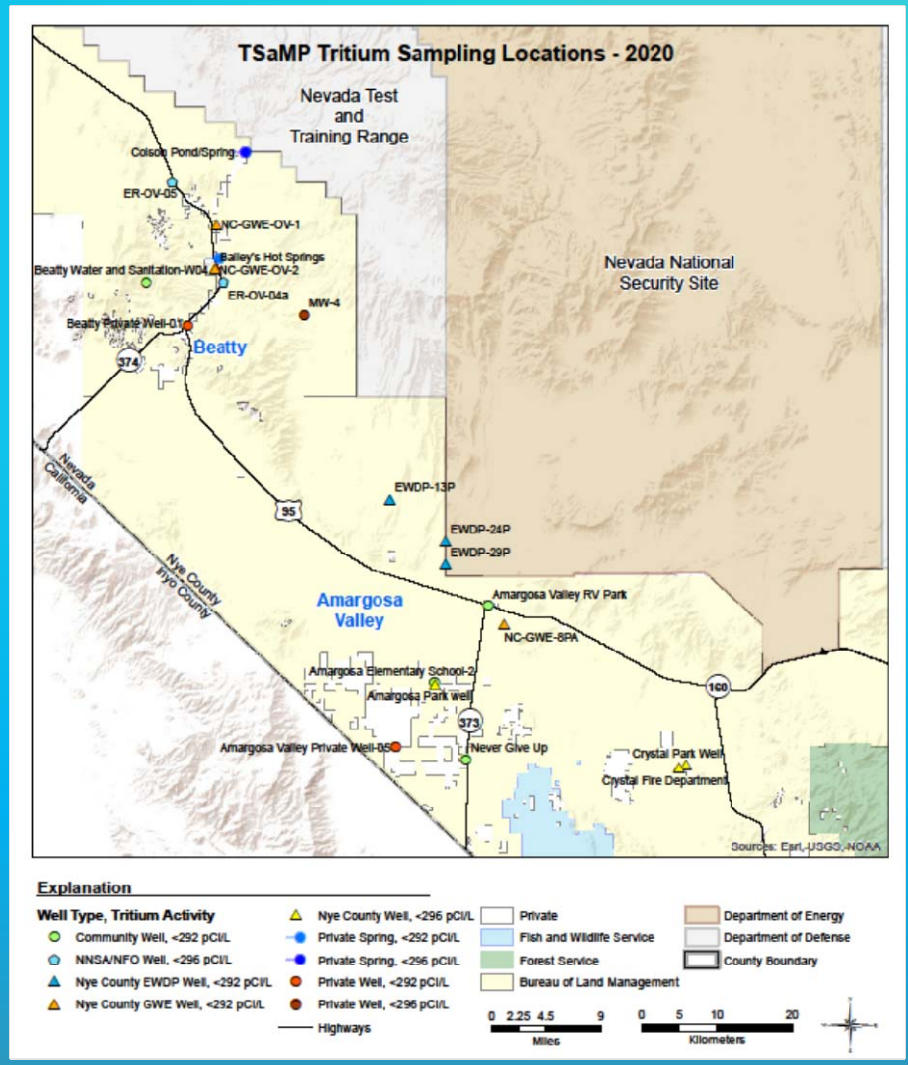
2019 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-03
    - Amargosa Valley Private Well-04
    - Amargosa Valley USPS
    - Beatty Water and Sanitation Well 1
    - Cave Spring
    - ER-OV-02
    - ER-OV-03a3
    - EWDP-7S
    - NC-GWE-Felderhoff-25-1PA
    - Revert Springs*
  - Test results showed all 20 sample locations had undetectable levels of tritium

* joint sampling effort with NSTec Ecological & Environmental Monitoring

2020 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Park well
    - Amargosa Valley Private Well-05
    - Beatty Private Well -01
    - Colson Pond/Spring**
    - Crystal Fire Department**
    - Crystal Park Well*'**
    - ER-OV-04a
    - ER-OV-05
    - EWDP-29P
    - MW-4
  - Test results showed all 20 sample locations had undetectable levels of tritium

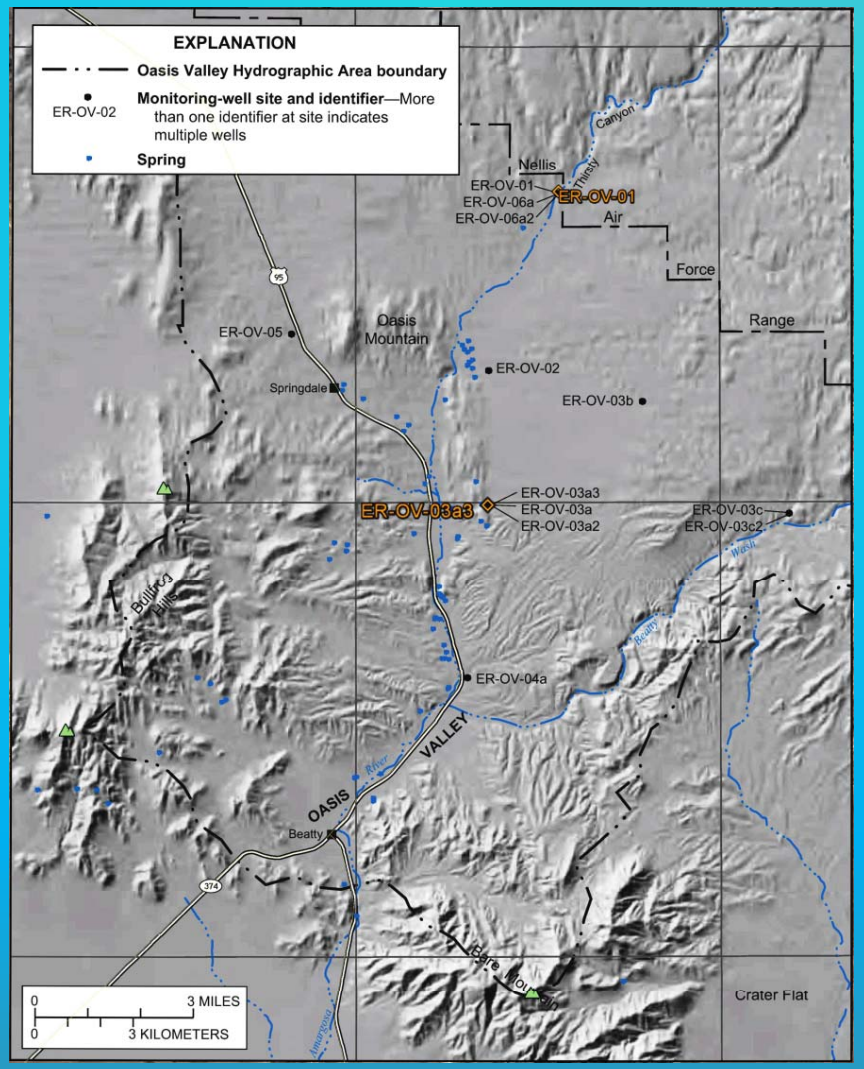


* joint sampling effort with NSTec Ecological & Environmental Monitoring

* * 5-year resampling of selected wells – new starting in 2220

ER-OV Wells
(DOE EM NV UGTA Wells)

- Wells are NE of Beatty and downgradient from Pahute Mesa
- Adds flexibility to TSaMP program and allows for a coordinated joint sampling effort with DRI
- Nye County will continue sampling at least one ER-OV well each year

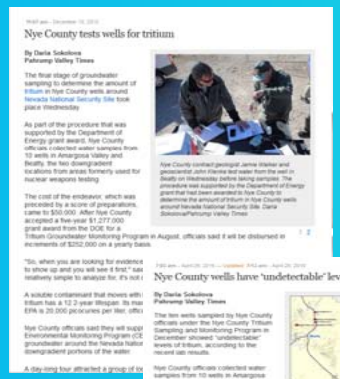


* Image from USGS WRIR 98-4184

Public Outreach

- TSaMP presentation given at the May 20,2020 NSSAB meeting
- Featured in DOE EM Update Newsletter, June 30,2020
- Articles run in local newspaper (PVT) 2015 – 2018, and 2020
- Supplied sampling locations and results for inclusion in the NNSSER 2015 – 2020*
- Presented poster at DOE Groundwater Open House meetings in Amargosa- 2016 & 2019
- Tour for the NSSAB and CEM's – 2015

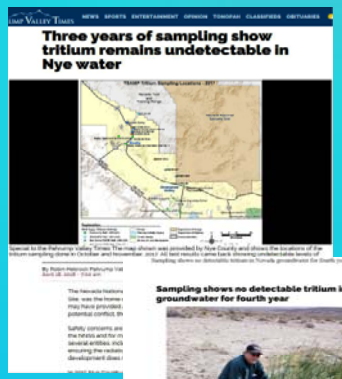
* Report in progress

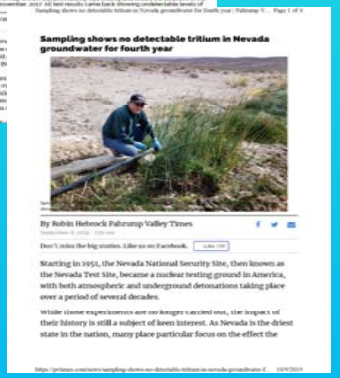

Nye County tests wells for tritium

By Darla Sokolova
Pahrump Valley Times


Nye County wells have 'undetectable' levels of tritium

By Darla Sokolova
Pahrump Valley Times


Three years of sampling show tritium remains undetectable in Nye water


Sampling shows no detectable tritium in Nevada groundwater for fourth year

By Robin Hebrock Pahrump Valley Times


DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

Quality Assurance

- Nye County coordinates sampling efforts through Quality Assurance Officer (QAO)
- Nye County conducts annual internal audits to insure integrity of TSaMP data
  - Audit conducted by qualified professional (QAO)
  - Field surveillances
  - Office surveillances
  - Reports submitted to NWRPO /NRFF
- Since 2016, Nye County has been hosting preliminary reconnaissance fieldtrips with the DOE EM Nevada Program to insure maximum benefits will be gained from site selections

December 18, 2016

Darrell Lacy, Director
Nye County TSAMP Project Director
250 N. Hwy 160 #1
Pahrump, NV 89060

Nye County TSAMP Internal Audit Report, TSAMP-2016-01

Enclosed please find the TSAMP internal audit report, TSAMP-2016-01, conducted December 5-7, 2016. Included in the audit report are 3 observations and 1 finding that were made during the audit along with suggested corrective actions and recommendations. The finding was addressed during the audit, and all data packages will be submitted in a timely manner. If you have any questions please let me know or you can also refer to QAP-16.1.

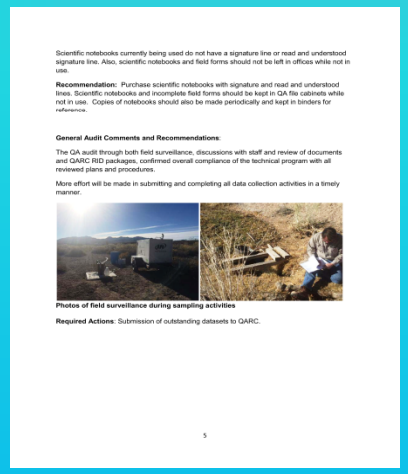
Regards,

Kathy Gilmore
Quality Assurance Officer

Cc: John Kenke,
Celeste Sandoval/QARC

Attachments: Audit Report and Audit Checklist

1



Scientific notebooks currently being used do not have a signature line or read and understood signature line. Also, scientific notebooks and field forms should not be left in offices while not in use.

Recommendation: Purchase scientific notebooks with signature and read and understood lines. Scientific notebooks and incomplete field forms should be kept in QA file cabinets while not in use. Copies of notebooks should also be made periodically and kept in binders for reference.

General Audit Comments and Recommendations:

The QA audit through both field surveillance, discussions with staff and review of documents and QARC RID packages, confirmed overall compliance of the technical program with all reviewed plans and procedures.

More effort will be made in submitting and completing all data collection activities in a timely manner.

Photos of field surveillance during sampling activities

Required Actions: Submission of outstanding datasets to QARC.

5

Quality Assurance– cont

- Navarro conducted independent assessment of TSaMP (11/5/18 - 12/12/18)
- Four Observations Identified
  - Upper level documents and procedures outdated
  - Lines of communication between participants is not fully documented
  - "Checked By/Date" on Chain of Custody forms not completed.
  - Groundwater Chemistry and Analysis sheet describes using charge balance as part of validation process.
- Nye County updated all QA documentation (WP-11, TPN 11.8, TP-11.2, and HASP) and addressed all observations prior to the 2019 sampling season.


ASSESSMENT REPORT/ INFORMATION FORM

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Nye County Natural Resources and Federal Facilities Office
John Klenke
July 30, 2022

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- Nye County population of 51,591 (Census Bureau. 2020)

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Population - cont

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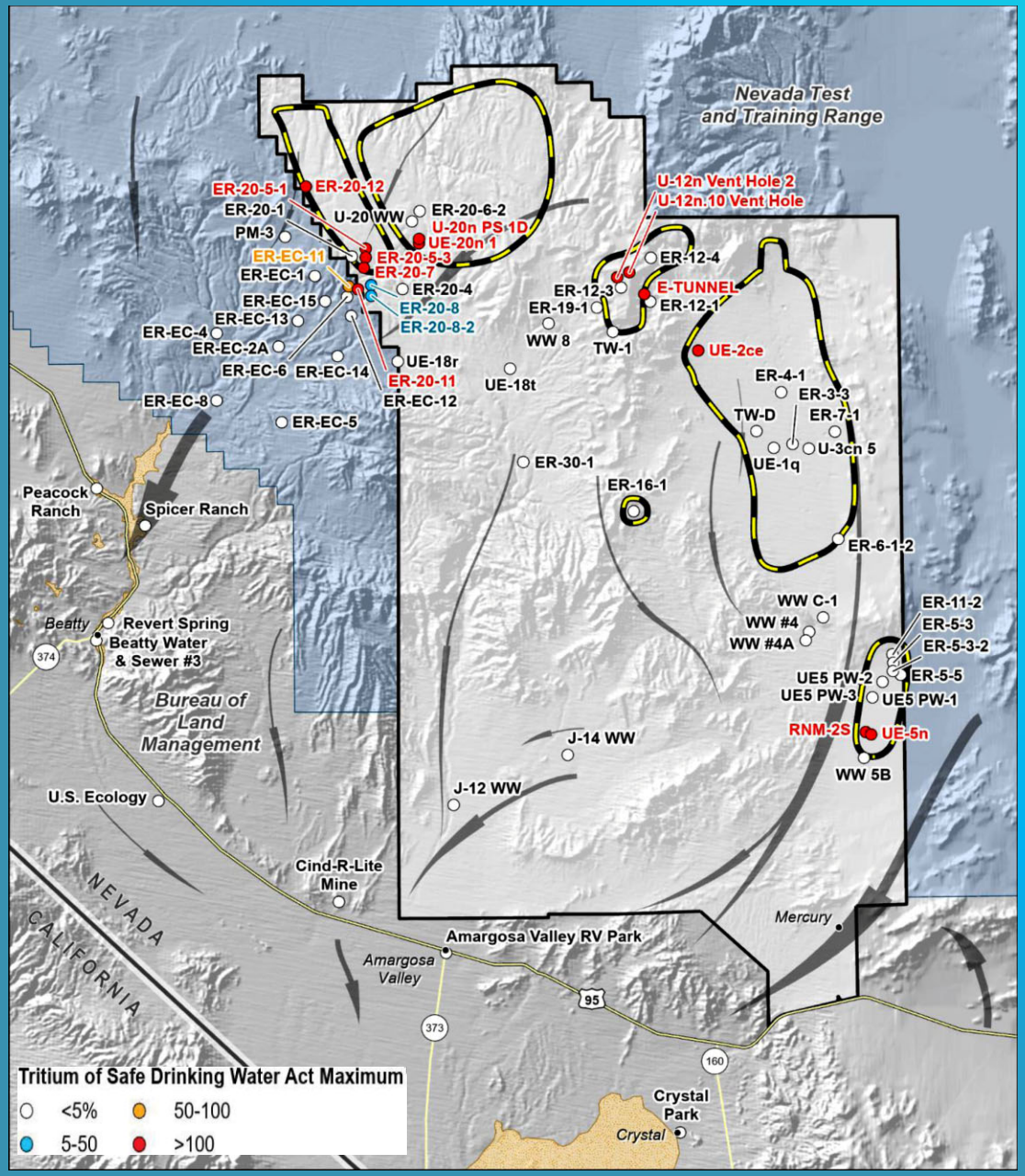

* Fig 5-2, Nevada National Security Site Environmental Report 2020

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- NNSS: Nevada National Security Site (1360 square miles, DOE)
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  - Geology/Hydrology
    - Faults, Rock/Soil types
  - Used results from above sources to locate candidate wells and springs
    - Availability/Access, Screened intervals, Casing type and diameter
  - Broadened baseline from locations previously sampled, by including some of the wells drilled by Nye County as part of past scientific characterization programs

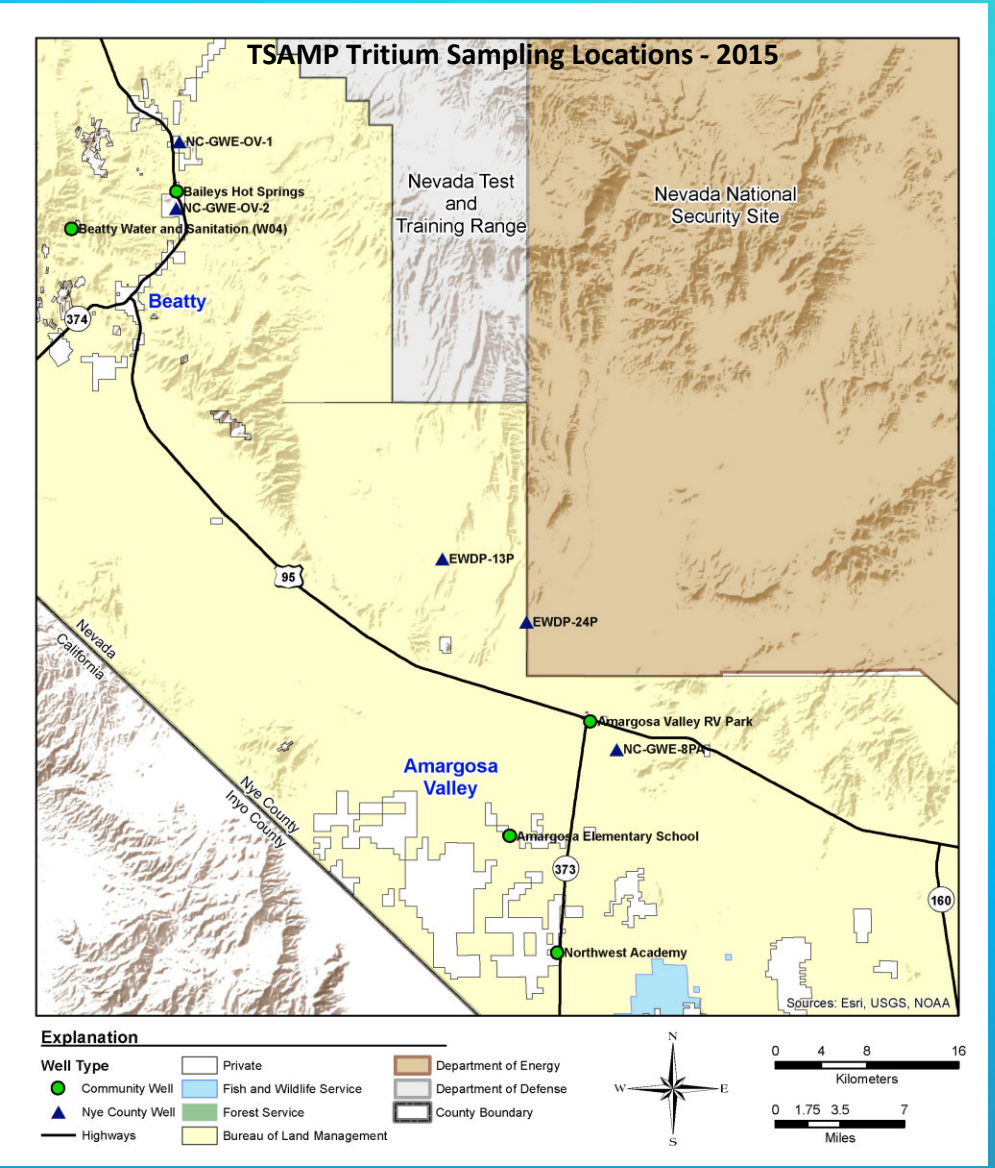
Core Well Sampling Results (2015-2021)

- Established 10 core wells in 2015
  - Core wells are sampled every year and considered to be of high sampling priority
    - Amargosa Elementary School*
    - Amargosa Valley RV Park
    - Baileys Hot Springs
    - Beatty Water and Sanitation (W04)
    - EWDP-13P
    - EWDP-24P
    - GWE-OV-1
    - GWE-OV-2
    - GWE-8PA
    - Northwest Academy**
  - Test results showed all 10 core wells had undetectable levels of tritium in 2015 - 2021***

* Well abandoned and replaced by "Amargosa Elementary School-2" in 2019

** Location renamed "Never Give Up" in 2019

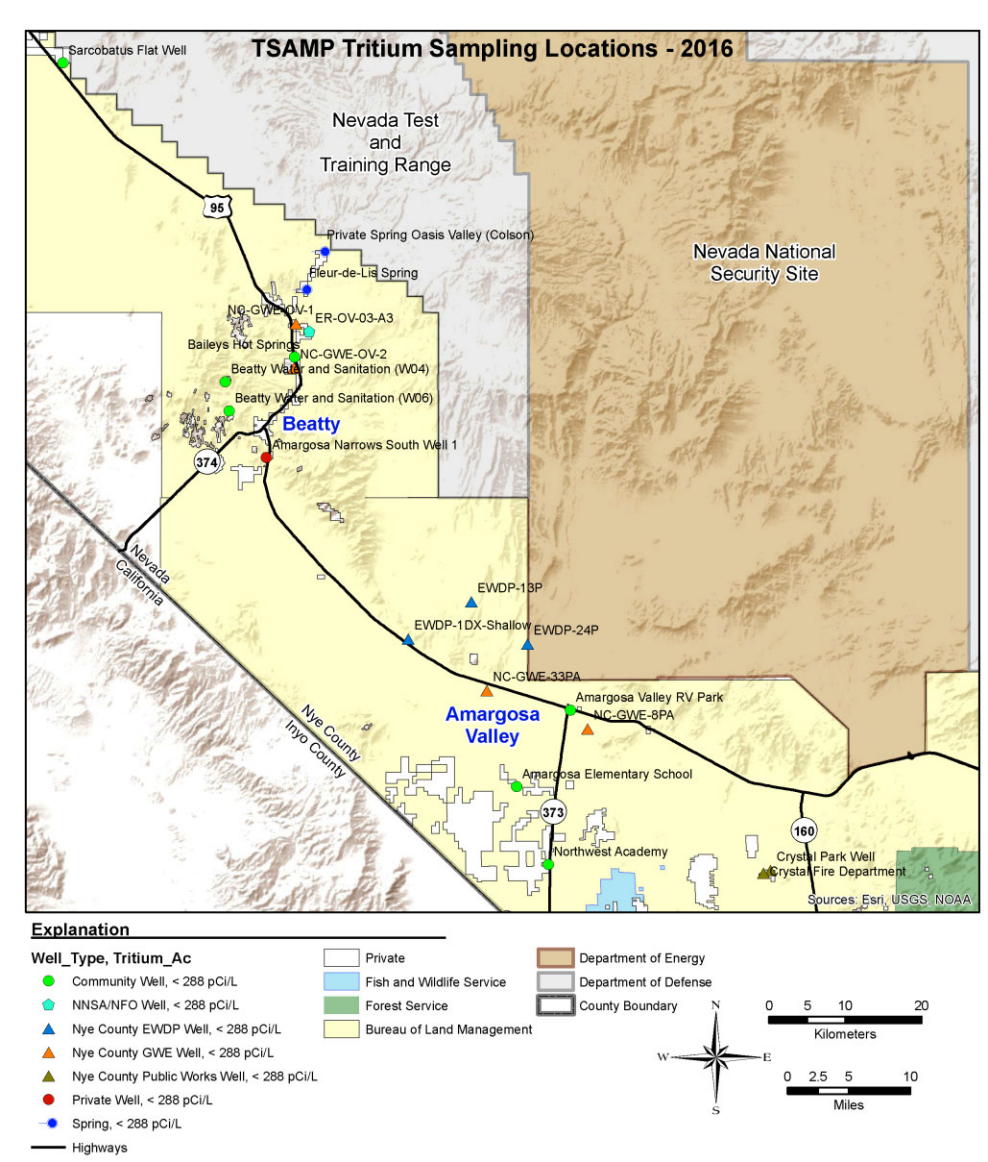
*** RSE is using EPA-approved, unenriched scintillation counting method with MDCs of approximately 300 pCi/L



2016 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Narrows South Well 1
    - Beatty Water and Sanitation (W06)
    - Crystal Fire Department
    - Crystal Park Well
    - EWDP-1DX-Shallow
    - ER-OV-03-A3 *
    - Fleur-de-Lis Spring
    - GWE-33PA
    - Private Spring Oasis Valley (Colson)
    - Sarcobatus Flat Well
  - Test results showed all 20 sample locations had undetectable levels of tritium

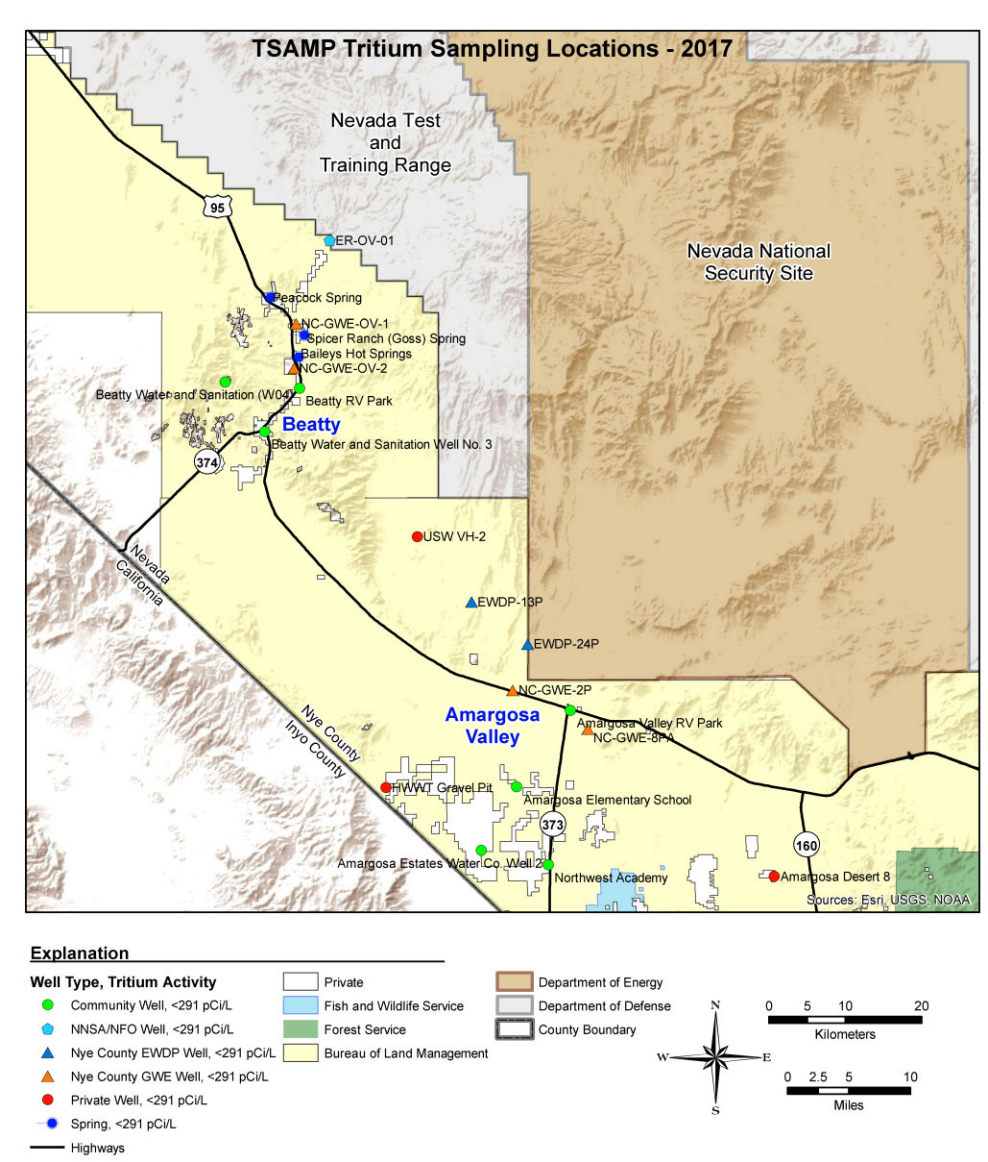
*Nye Co. started sampling ER-OV wells in 2016



2017 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Desert 8
    - Amargosa Estates Water Co. Well 2
    - Beatty RV Park
    - Beatty Water and Sanitation Well No. 3*
    - ER-OV-01
    - HWWT Gravel Pit
    - NC-GWE-2P
    - Peacock Spring*
    - Spicer Ranch (Goss) Spring
    - USW VH-2
  - Test results showed all 20 sample locations had undetectable levels of tritium

* joint sampling effort with NSTec Ecological & Environmental Monitoring



2018 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Estates Water Co. Well 1
    - Amargosa Valley Private Well-01 *
    - Amargosa Valley Private Well-02-wellhead*
    - Beatty Water and Sanitation Well EW4
    - Bryan Spring
    - Crystal Private Well-01 *
    - ER-OV-03b
    - ER-OV-06a
    - Lower Indian Spring
    - Nye Co. Station #2
  - Test results showed all 20 sample locations had undetectable levels of tritium

* private well sample – new starting in 2018 with sequential number assigned for each area (Beatty, Amargosa, and Crystal)

2019 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-03
    - Amargosa Valley Private Well-04
    - Amargosa Valley USPS
    - Beatty Water and Sanitation Well 1
    - Cave Spring
    - ER-OV-02
    - ER-OV-03a3
    - EWDP-7S
    - NC-GWE-Felderhoff-25-1PA
    - Revert Springs*
  - Test results showed all 20 sample locations had undetectable levels of tritium

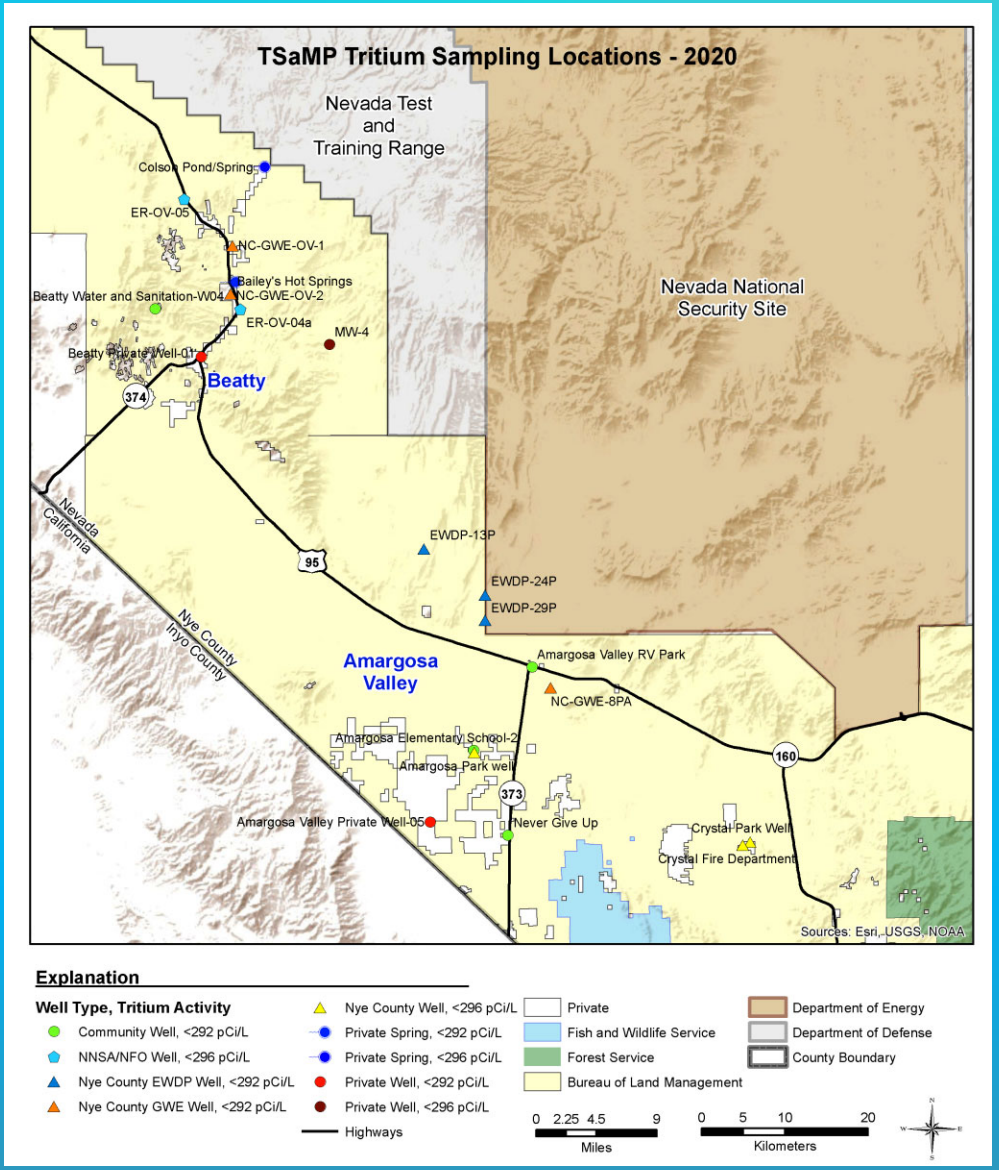
* joint sampling effort with NSTec Ecological & Environmental Monitoring

2020 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Park well
    - Amargosa Valley Private Well-05
    - Beatty Private Well -01
    - Colson Pond/Spring**
    - Crystal Fire Department**
    - Crystal Park Well*′**
    - ER-OV-04a
    - ER-OV-05
    - EWDP-29P
    - MW-4
  - Test results showed all 20 sample locations had undetectable levels of tritium

* joint sampling effort with NSTec Ecological & Environmental Monitoring

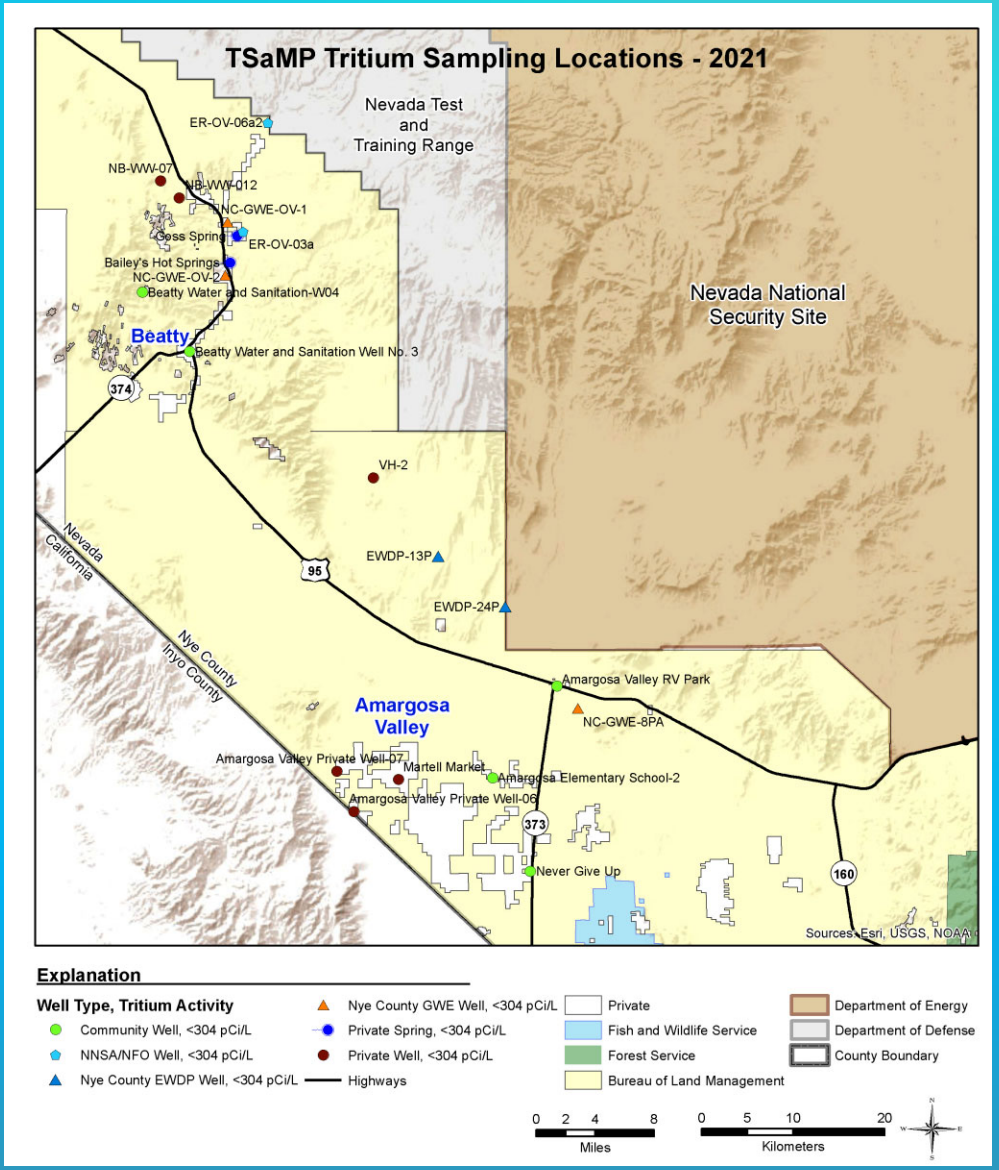
* * 4-year resampling of selected wells – new starting in 2220



2021 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-06
    - Amargosa Valley Private Well-07
    - Beatty Water and Sanitation
      - Well No. 3**
    - ER-OV-03a
    - ER-OV-06a2
    - Goss Spring**
    - Martell Market
    - NB-WW-07
    - NB-WW-12
    - VH-2**
  - Test results showed all 20 sample locations had undetectable levels of tritium

* * 4-year resampling of selected wells

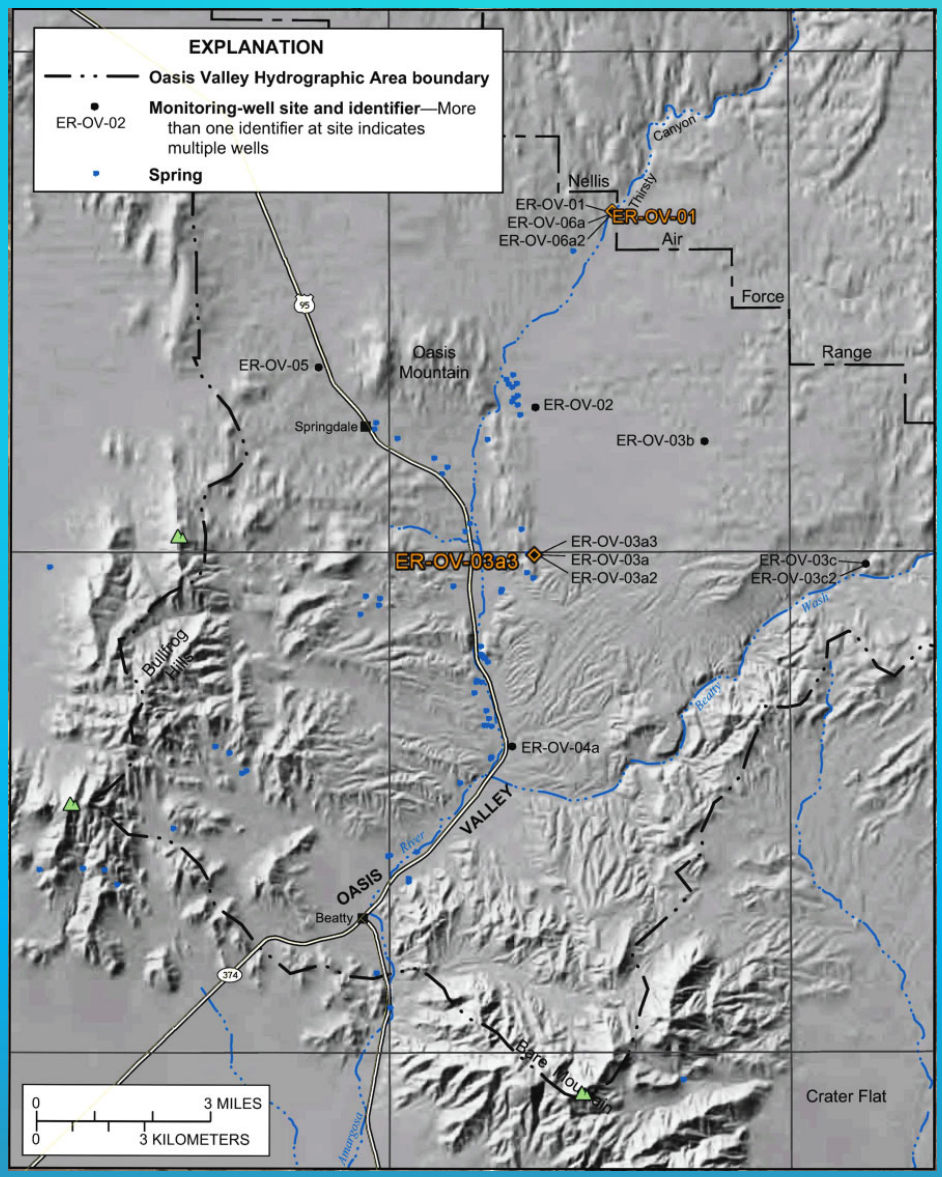


ER-OV Wells

(DOE EM NV UGTA Wells)

- Wells are NE of Beatty and downgradient from Pahute Mesa
- Adds flexibility to TSaMP program and allows for a coordinated joint sampling effort with DRI
- Nye County will continue sampling at least one ER-OV well each year

DOE : United States Department Of Energy
EM NV: Office of Environmental Management Nevada Program
UGTA: Underground Test Area program



* Image from USGS WRIR 98-4184

ER-OV Wells - cont

(DOE EM NV UGTA Wells)

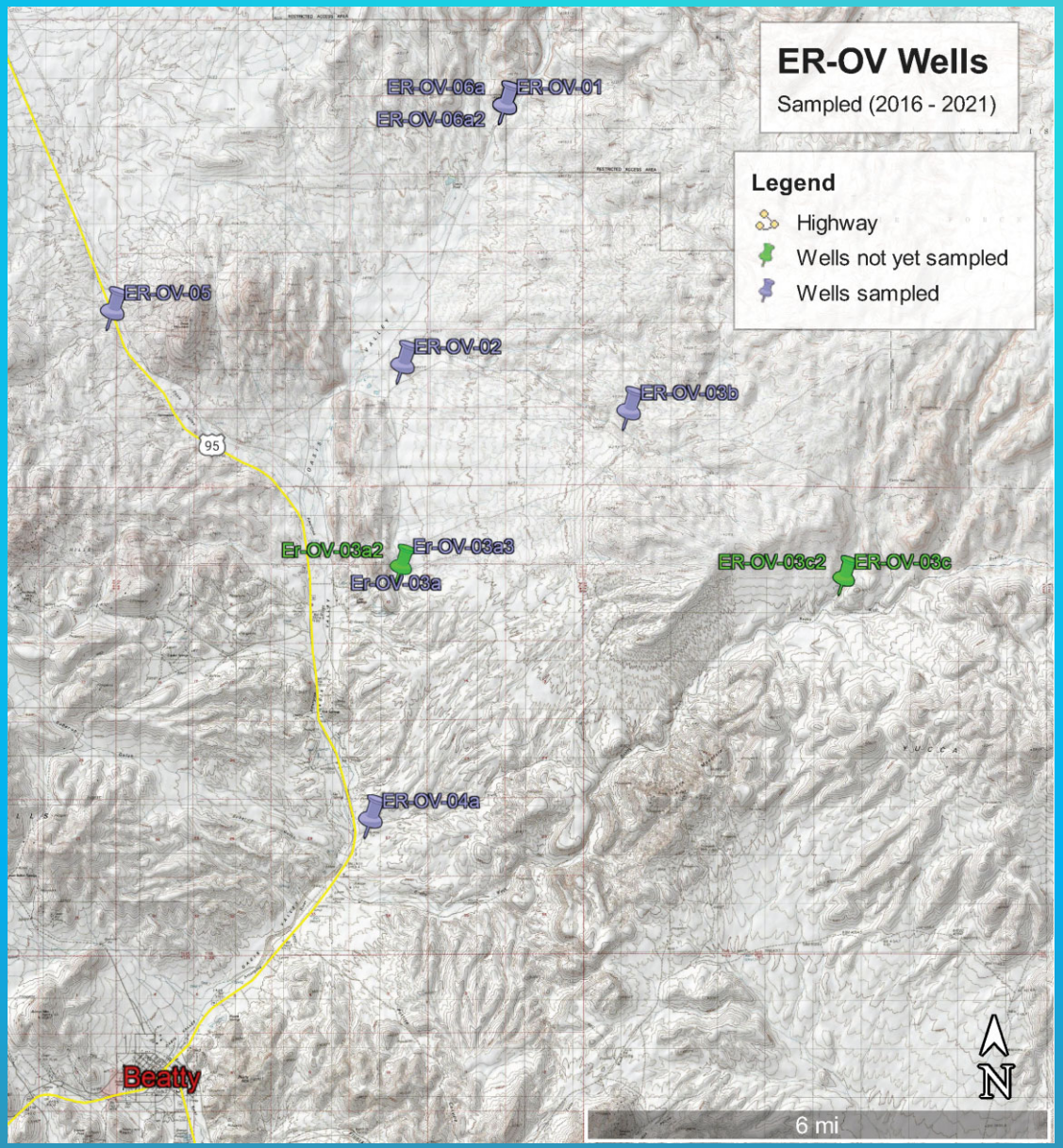
ER-OV wells sampled

- ER-OV-01 (2017)
- ER-OV-02 (2019)
- ER-OV-03a (2021)
- ER-OV-03b (2018)
- ER-OV-03a3 (2016, 2019)
- ER-OV-04a (2020)
- ER-OV-05 (2020)
- ER-OV-06a (2018)
- ER-OV-06a2 (2021)

ER-OV wells not yet sampled

- ER-OV-03a2 (2023?)
- ER-OV-03c (2022?)
- ER-OV-03c2 (2022?)

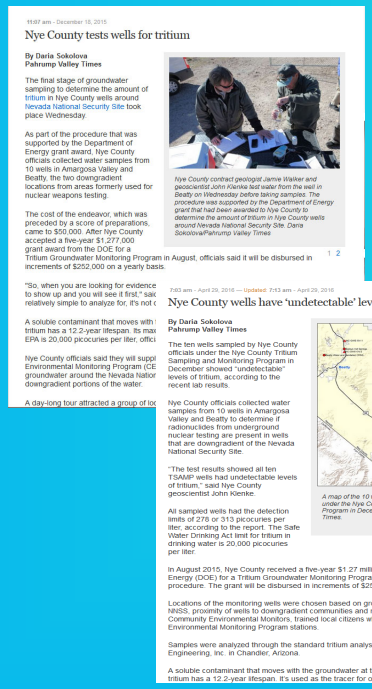
DOE : United States Department Of Energy
EM NV: Office of Environmental Management Nevada Program
UGTA: Underground Test Area program



Public Outreach

- TSaMP presentation given at the May 20,2020 NSSAB meeting
- Featured in DOE EM Update Newsletter, June 30,2020
- Articles run in local newspaper (PVT) 2015 – 2018, 2020 and 2021
- Supplied sampling locations and results for inclusion in the NNSSER 2015 – 2022*
- Presented poster at DOE Groundwater Open House meetings in Amargosa- 2016 & 2019
- Tour for the NSSAB and CEM's – 2015

* Report in progress



Nye County tests wells for tritium

By Daria Sokolova
Pahrump Valley Times

The final stage of groundwater sampling to determine the amount of tritium in Nye County wells around Nevada National Security Site took place Wednesday.

As part of the procedure that was supported by the Department of Energy grant award, Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty, the two downgradient locations from areas formerly used for nuclear weapons testing.

The cost of the endeavor, which was preceded by a score of preparations, came to $50,000. After Nye County accepted a five-year $1,277,000 grant award from the DOE for a Tritium Groundwater Monitoring Program in August, officials said it will be disbursed in increments of $252,000 on a yearly basis.

"So, when you are looking for evidence to show up and you will see it first," said relatively simple to analyze for, it's not c

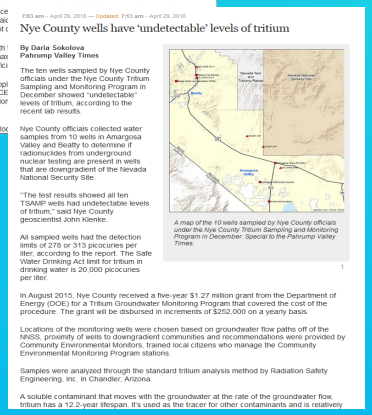
A soluble contaminant that moves with tritium has a 12.2-year lifespan. Its max EPA is 20,000 picocuries per liter; offici

Nye County officials said they will suppl Environmental Monitoring Program (CE groundwater around the Nevada Natior downgradient portions of the water.

A day-long tour attracted a group of loc

Nye County contract geologist Jamie Walker and geoscientist John Klenke test water from the well in Beatty on Wednesday before taking samples. The procedure was supported by the Department of Energy grant that had been awarded to Nye County to determine the amount of tritium in Nye County wells around Nevada National Security Site. Daria Sokolova/Pahrump Valley Times

1 2



Nye County wells have 'undetectable' levels of tritium

By Daria Sokolova
Pahrump Valley Times

The ten wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December showed "undetectable" levels of tritium, according to the recent lab results.

Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty to determine if radionuclides from underground nuclear testing are present in wells that are downgradient of the Nevada National Security Site.

"The test results showed all ten TSAMP wells had undetectable levels of tritium," said Nye County geoscientist John Klenke.

All sampled wells had the detection limits of 278 or 313 picocuries per liter, according to the report. The Safe Water Drinking Act limit for tritium in drinking water is 20,000 picocuries per liter.

A map of the 10 wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December. Special to the Pahrump Valley Times.

1

In August 2015, Nye County received a five-year $1.27 million grant from the Department of Energy (DOE) for a Tritium Groundwater Monitoring Program that covered the cost of the procedure. The grant will be disbursed in increments of $252,000 on a yearly basis.

Locations of the monitoring wells were chosen based on groundwater flow paths off of the NNSS, proximity of wells to downgradient communities and recommendations were provided by Community Environmental Monitors, trained local citizens who manage the Community Environmental Monitoring Program stations.

Samples were analyzed through the standard tritium analysis method by Radiation Safety Engineering, inc. in Chandler, Arizona.

A soluble contaminant that moves with the groundwater at the rate of the groundwater flow, tritium has a 12.2-year lifespan. It's used as the tracer for other contaminants and is relatively

Three years of sampling show tritium remains undetectable in Nye water

Special to the Pahrump Valley Times The map shown was provided by Nye County and shows the locations of the tritium sampling done in October and November 2017. All test results came back showing undetectable levels of

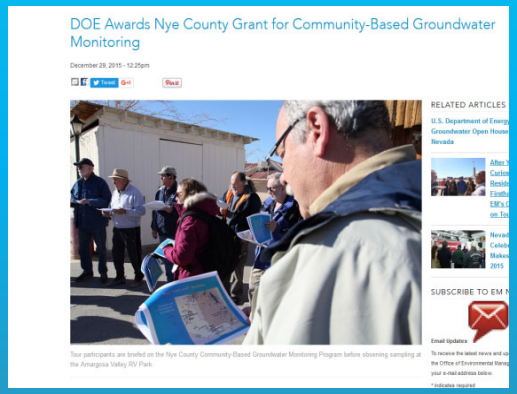
Sampling shows no detectable tritium in Nevada groundwater for fourth year

By Robin Hebrock Pahrump Valley Times

Don't miss the big stories. Like us on Facebook.

Starting in 1951, the Nevada National Security Site, then known as the Nevada Test Site, became a nuclear testing ground in America, with both atmospheric and underground detonations taking place over a period of several decades.

While those experiments are no longer carried out, the impact of their history is still a subject of keen interest. As Nevada is the driest state in the nation, many place particular focus on the effect the



DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

December 29, 2015 - 12:25pm

RELATED ARTICLES

SUBSCRIBE TO EM

Tour participants are briefed on the Nye County Community-Based Groundwater Monitoring Program before observing sampling at the Amargosa Valley RV Park.

Annual Nevada National Security Site Environmental Report (NNSSER)

Cathy Wills
National Security Technologies (NSTec), Lead Author
Nevada Site Specific Advisory Board
November 19, 2014

Environmental Management
safety ◆ performance ◆ cleanup ◆ closure
www.em.doe.gov

Quality Assurance

- Nye County coordinates sampling efforts through Quality Assurance Officer (QAO)
- Nye County conducts annual internal audits to insure integrity of TSaMP data
  - Audit conducted by qualified professional (QAO)
  - Field surveillances
  - Office surveillances
  - Reports submitted to NWRPO /NRFF
- Since 2016, Nye County has been hosting preliminary reconnaissance fieldtrips with the DOE EM Nevada Program to insure maximum benefits will be gained from site selections

December 18, 2016

Darrell Lacy, Director
Nye County TSAMP Project Director
250 N. Hwy 160 #1
Pahrump, NV 89060

Nye County TSAMP Internal Audit Report, TSAMP-2016-01

Enclosed please find the TSAMP internal audit report, TSAMP-2016-01, conducted December 5-7, 2016. Included in the audit report are 3 observations and 1 finding that were made during the audit along with suggested corrective actions and recommendations. The finding was addressed during the audit, and all data packages will be submitted in a timely manner. If you have any questions please let me know or you can also refer to QAP-18.1.

Regards,

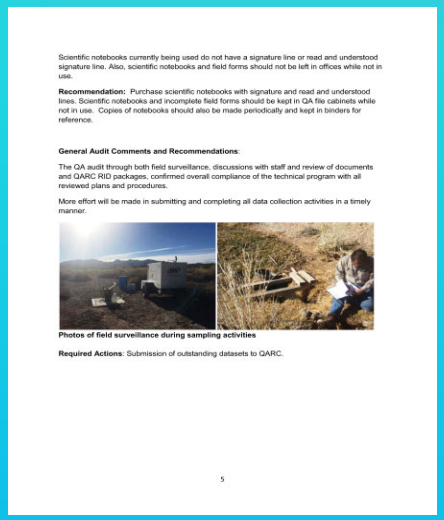
Kathy Gilmore

Quality Assurance Officer

Cc: John Klenke,
Celeste Sandoval/QARC

Attachments: Audit Report and Audit Checklist

1



Scientific notebooks currently being used do not have a signature line or read and understood signature line. Also, scientific notebooks and field forms should not be left in offices while not in use.

Recommendation: Purchase scientific notebooks with signature and read and understood lines. Scientific notebooks and incomplete field forms should be kept in QA file cabinets while not in use. Copies of notebooks should also be made periodically and kept in binders for reference.

General Audit Comments and Recommendations:

The QA audit through both field surveillance, discussions with staff and review of documents and QARC RID packages, confirmed overall compliance of the technical program with all reviewed plans and procedures.

More effort will be made in submitting and completing all data collection activities in a timely manner.

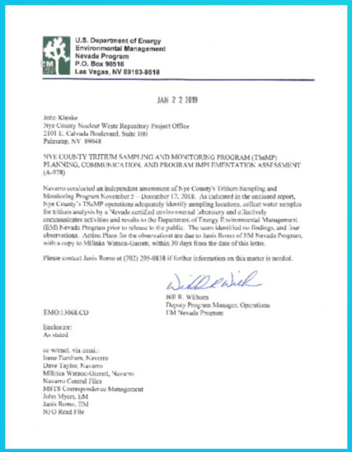
Photos of field surveillance during sampling activities

Required Actions: Submission of outstanding datasets to QARC.

5

Quality Assurance- cont

- Navarro conducted independent assessment of TSaMP (11/5/18 - 12/12/18)
- Four Observations Identified
  - Upper level documents and procedures outdated
  - Lines of communication between participants is not fully documented
  - “Checked By/Date” on Chain of Custody forms not completed.
  - Groundwater Chemistry and Analysis sheet describes using charge balance as part of validation process.
- Nye County updated all QA documentation (WP-11, TPN 11.8, TP-11.2, and HASP) and addressed all observations prior to the 2019 sampling season.



U.S. Department of Energy
Environmental Management
Nevada Program
P.O. Box 98518
Las Vegas, NV 89193-8518

JAN 2 2 2019

John Klenke
Nye County Nuclear Waste Repository Project Office
2101 E. Calvada Boulevard, Suite 100
Pahrump, NV 89048

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM (TSaMP) PLANNING, COMMUNICATION, AND PROGRAM IMPLEMENTATION ASSESSMENT (A-978)

Navarro conducted an independent assessment of Nye County's Tritium Sampling and Monitoring Program November 5 – December 12, 2018. As indicated in the enclosed report, Nye County's TSaMP operations adequately identify sampling locations, collect water samples for tritium analysis by a Nevada certified environmental laboratory and effectively communicates activities and results to the Department of Energy Environmental Management (EM) Nevada Program prior to release to the public. The team identified no findings, and four observations. Action Plans for the observations are due to Janis Romo of EM Nevada Program, with a copy to Milinka Watson-Garrett, within 30 days from the date of this letter.

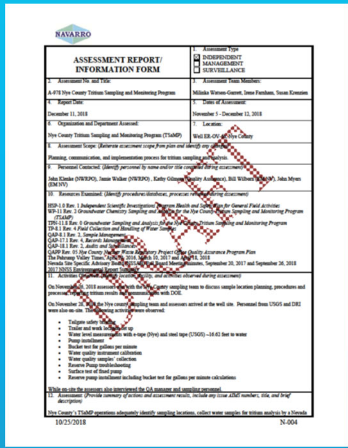
Please contact Janis Romo at (702) 295-0838 if further information on this matter is needed.

Bill R. Wilborn
Deputy Program Manager, Operations
EM Nevada Program

EMO:13068.CD

Enclosure:
As stated

cc w/encl. via email:
Irene Farnham, Navarro
Dave Taylor, Navarro
Milinka Watson-Garrett, Navarro
Navarro Central Files
MSTS Correspondence Management
John Myers, EM
Janis Romo, EM
NFO Read File



NAVARRO

ASSESSMENT REPORT/ INFORMATION FORM	1. Assessment Type ☒ INDEPENDENT ☐ MANAGEMENT ☐ SURVEILLANCE
2. Assessment No. and Title: A-978 Nye County Tritium Sampling and Monitoring Program	3. Assessment Team Members: Milinka Watson-Garrett, Irene Farnham, Susan Krenzien
4. Report Date: December 11, 2018	5. Dates of Assessment: November 5 - December 12, 2018
6. Organization and Department Assessed: Nye County Tritium Sampling and Monitoring Program (TSaMP)	7. Location: Well ER-OV-[illegible] Nye County
8. Assessment Scope: *(Reiterate assessment scope from plan and identify any changes)* Planning, communication, and implementation process for tritium sampling and analysis.	
9. Personnel Contacted: *(Identify personnel by name and/or title contacted during assessment)* John Klenke (NWRPO), Jamie Walker (NWRPO), Kathy Gilmore (Quality Assurance), Bill Wilborn (EM NV), John Myers (EM NV)	
10. Resources Examined: *(Identify procedures/databases, processes reviewed during assessment)* HSP-1.0 Rev. 1 *Independent Scientific Investigations Program Health and Safety Plan for General Field Activities* WP-11 Rev. 2 *Groundwater Chemistry Sampling and Analysis for the Nye County Tritium Sampling and Monitoring Program (TSAMP)* TPN-11.8 Rev. 0 *Groundwater Sampling and Analysis for the Nye County Tritium Sampling and Monitoring Program* TP-8.1 Rev. 4 *Field Collection and Handling of Water Samples* QAP-8.1 Rev. 2, *Sample Management* QAP-17.1 Rev. 4, *Records Management* QAP-18.1 Rev. 2, *Audits and Surveillances* QAPP Rev. 05 *Nye County Nuclear Waste Repository Project Office Quality Assurance Program Plan* The Pahrump Valley Times, April [illegible], 2016, March 10, 2017 and April 18, 2018 Nevada Site Specific Advisory Board (NSSAB) Full Board Meeting minutes, September 20, 2017 and September 26, 2018 2017 NNSS Environmental Report Summary	
11. Activities Observed: *(Identify location, facility, and activities observed during assessment)* On November [illegible], 2018 assessors met with the Nye County sampling team to discuss sample location planning, procedures and processes, reporting tritium results and communication with DOE. On November 28, 2018 the Nye county sampling team and assessors arrived at the well site. Personnel from USGS and DRI were also on-site. The following activities were observed: • Tailgate safety briefing • Trailer and work location set up • Water level measurements with e-tape (Nye) and steel tape (USGS) ~16.62 feet to water • Pump installment • Bucket test for gallons per minute • Water quality instrument calibration • Water quality samples' collection • Reserve Pump troubleshooting • Surface test of fixed pump • Reserve pump installment including bucket test for gallons per minute calculations While on-site the assessors also interviewed the QA manager and sampling personnel.	
12. Assessment: *(Provide summary of actions and assessment results, include any issue AIMS numbers, title, and brief description)* Nye County's TSaMP operations adequately identify sampling locations, collect water samples for tritium analysis by a Nevada	

10/25/2018 N-004

DRAFT

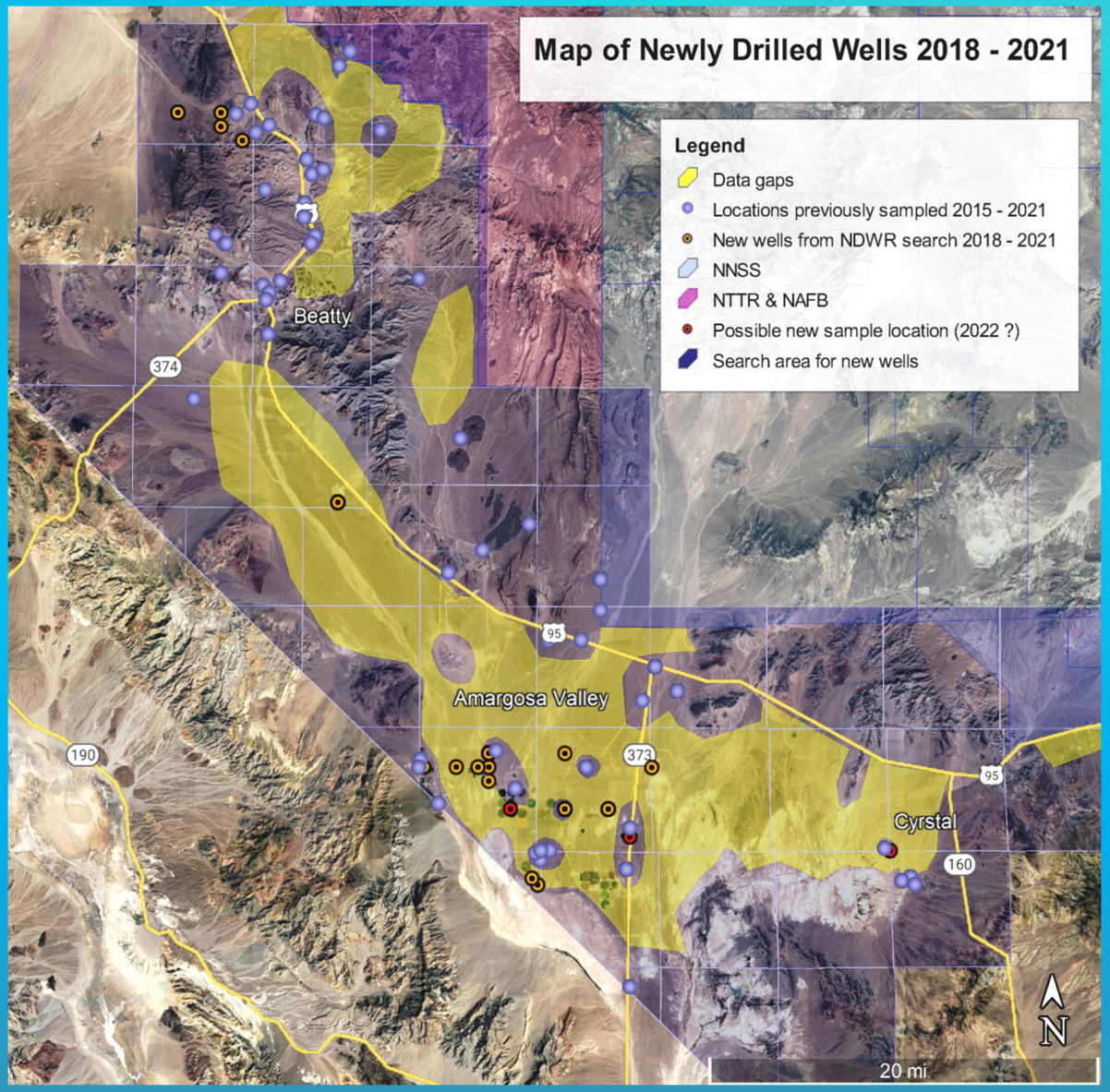
Town Board Meetings

- TSaMP presentations were given at Beatty Town Board meetings on 9/25/17, and 11/4/19; and at Amargosa Town Board meetings on 9/27/17, and 11/21/19
- 2017 presentations resulted in three new sampling locations for 2017, and several potential new sites for future years.
- 2019 presentations resulted in one new sampling location for 2019, one for 2020, one for 2021, and five potential new sites for future years.

Possible Sampling Locations 2022

Map showing location of newly drilled wells downgradient of the NNSS

- Locations previously sampled for tritium (2015 to 2021) shown as gray dots.
- Dark outline show area of search for new wells (in NDWR database).
- Yellow areas indicate areas of data gaps in TSaMP program
- Wells identified as being newly drilled (2018 to 2021) shown as orange circles
  - Three red dots indicate possible future sampling locations (2022?) selected from the newly drilled wells



Possible Sampling Locations 2022 -cont

- What are the priorities for well sampling locations?
  - Wells used by communities?
  - Wells that provide early detection but may not be potable water sources?
- What wells or other locations do members of public consider to be of highest priority?
- What locations do you feel should be sampled?
  - 2022
- When making your individual recommendation, please consider:
  - Past sampling results
    - Identified flow paths and historic sampling results
    - Age of water (Tritium half-life = 12.32 yrs – less than 1% remaining after 7 half-lives (86 yrs)
- Would you like to participate in the water sampling?
- We welcome any participation!

Questions?

Contact Information:
John Klenke
Geoscientist III
jklenke@co.nye.nv.us
Office: 775-727-3494

NYE COUNTY TRITIUM SAMPLING AND MONITORING PROGRAM 2023 UPDATE

John Klenke
CEMP Workshop
July 10, 2023

MATERIAL IN THE FOLLOWING PRESENTATION SOLELY REPRESENTS THE VIEWPOINT OF THE AUTHOR AND DOES NOT REPRESENT DRI OR DOE.

Overview

- Background
- Land Status
- Population
- Responsibilities
- CEMP Stations and Focus Area
- Locations Sampled by DOE
- Determining Nye County Sample Locations
- Core Well Sampling Results (2015-2022)
- Sampling Results (2016 - 2022)
- ER-OV Wells
- Public Outreach
- Quality Assurance
- Town Board Meetings
- Possible Sampling Locations for 2023

Background – Why Are We Here?

- Nye County has the duty to protect the health and safety of citizens
- Through its Nuclear Waste Repository Project Office (NWRPO), Nye County conducted scientific characterization of the area between Yucca Mountain and the Town of Amargosa
  - Drilled and completed approximately 50 wells
  - Conducted numerous aquifer and tracer tests, geophysical surveys, water level measurements, and other specialized testing
  - Data provided to Department of Energy (DOE)
- Tritium from former weapons tests has been observed migrating on and off the NNSS
  - Offsite migration is only located on federally- controlled land and below the SDWA standards. Note: It is approximately 13.5 miles SW (downgradient) to the nearest publicly accessible lands.
- Currently in an eleven-year* grant with DOE to conduct tritium sampling and analysis at locations downgradient from areas formerly used for nuclear weapons testing

  * Grant extended to Aug 16, 2026

Land Status

- Nye County encompasses 18,199 mi^2
  - Largest county (by area) in the state, and the third-largest in contiguous US.
- Approximately 98% of land in Nye County is federally controlled
  - Bureau of Land Management
  - US Forest Service
  - Department of Defense
  - Department of Energy
- Nevada National Security Site -NNSS (formerly the Nevada Test Site is entirely within Nye County)
- Part of the Nevada Test and Training Range (NTTR) lies within Nye County
- Nye County population of 54,738 (Census Bureau Est. 7/1/22)
  - Up 3147 since 2020 census (51,591)

Population

Pahrump:

- Approximately 26 miles south from NNSS
- Population of 44,738 people (Census Bureau 2020)
  - Pahrump is the 12th most populated city in the state of Nevada, and one of the fastest growing communities in the west
- Estimated 88,314 people by 2060 (at 1.5% growth rate – NCWRP update 2017)

Amargosa:

- Approximately 9 miles SW from the border of NNSS
- 50 mile south (downgradient) from Pahute Mesa
- Population of 1,064 (Census Bureau 2020)

Population - cont

Beatty:

- Approximately 30 miles southwest (downgradient) from Pahute Mesa
- Population of 880 people (Census Bureau 2020)
- Approximately 25 miles southwest of well ER-EC-11*

* ER-EC-11 is located downgradient of Pahute Mesa, off the NNSS and on the Nevada Test and Training Range. Tritium was detected in ER-EC-11 in 2009 at 12,000 picocuries per liter (pCi/L), or 60% of EPA's Safe Drinking Water Act (SDWA). When re-sampled in 2017, levels had increased to 18,400 pCi/L, or to 92% of the SWDA.

Responsibilities

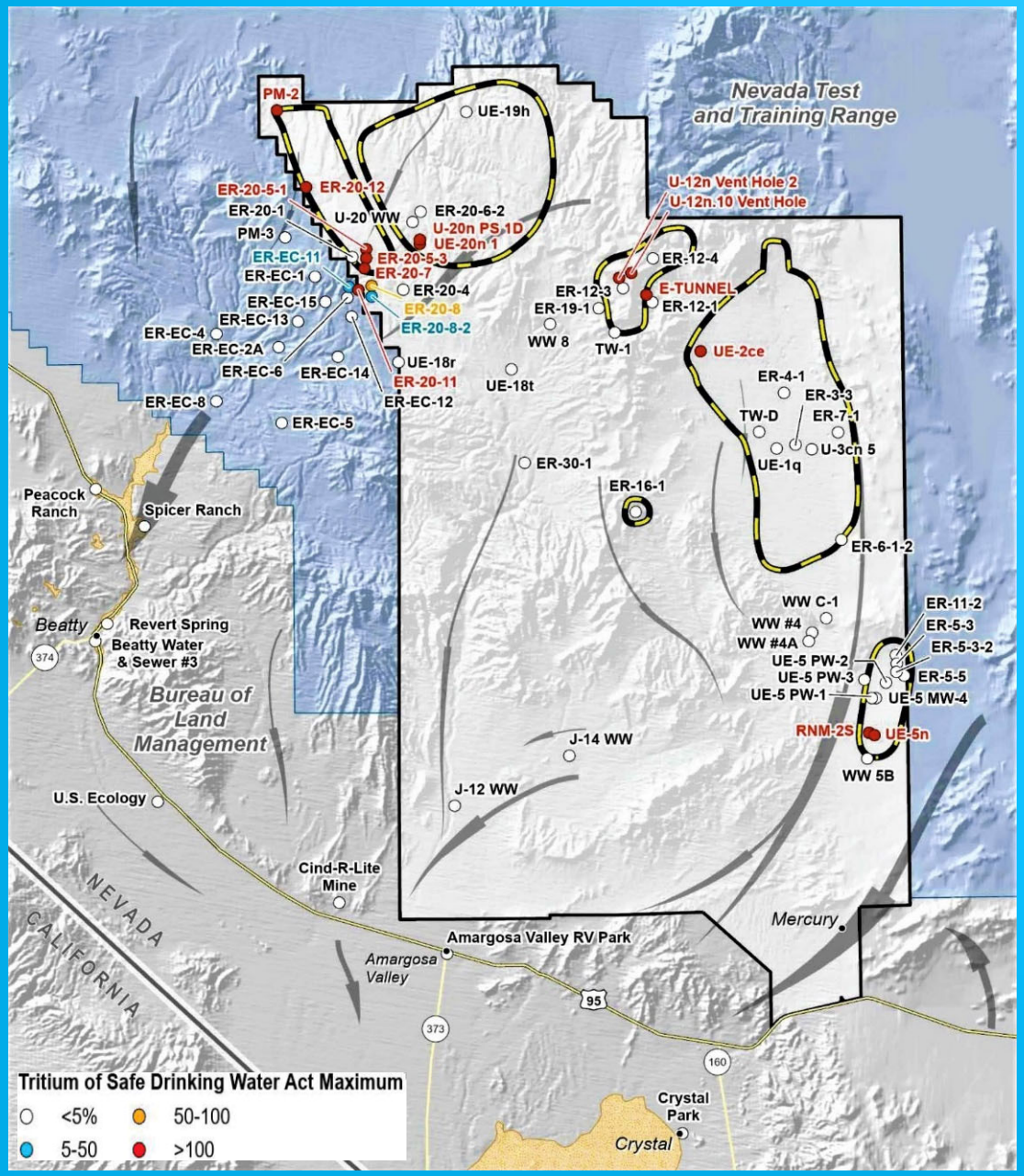
- Nye County is responsible for:
  - Identification of sampling locations (will consider input from the public)
  - Developing sampling plans and procedures – ensures systematic, consistent sampling methodology
  - Collection of water samples for tritium analysis
  - Obtaining tritium analysis though independent laboratories certified by the State of Nevada
  - Checking the data to ensure quality
  - Providing sampling methodology, data, and quality check results to DOE for inclusion in the Annual NNSS Site Environmental Report
- Fact sheets, brochures or handouts
- Local government awareness
- Public meetings and community events to ensure public's perspective is represented
- Data dissemination options include publication on the Nye County website (www.nyecounty.net) and/or continued publication on DRI's CEMP website (www.cemp.dri.edu)

CEMP Stations and Focus Area

- Map at right shows CEMP stations (6/13/22) (www.cemp.dri.edu)
- Regional groundwater flow direction is predominantly north to south
- Downgradient areas outlined by blue oval indicates TSaMP focus area
- Note: We are characterizing conditions in offsite areas only

*Image from CEMP website

Locations Sampled By DOE EM NV
(NNSA/NFO and EM NV Program)



* Fig 5-2, Nevada National Security Site Environmental Report 2021

- Map showing sampled sites under the NNSS Integrated Groundwater Monitoring Program on and off the NNSS and NTTR
- Tritium results are represented as a percentage of the Maximum SDWA Contaminant Level (20,000 pCi/L, as defined by the US Environmental Protection Agency)
- Note localized variations in the groundwater flow directions (arrows)

- DOE : United States Department Of Energy
- EM NV: Office of Environmental Management Nevada Program
- NNSA/NFO: U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office
- NNSS: Nevada National Security Site (1360 square miles, DOE)
- NTTR: Nevada Test and Training Range (4531 square miles, Department of Defense)
- SDWA: Safe Drinking Water Act - EPA 1974

Determining Nye County Sample Locations

- Data from the TSaMP water sampling program has allowed us to learn more about:
  - Quality of waters adjacent to and downgradient from the NNSS and NTTR
  - Changes in water quality with time
- Initial screening of candidate sites was based on the following criteria:
  - Proximity to population centers
  - Groundwater gradient (flow directions)
  - Geology/Hydrology
    - Faults, Rock/Soil types
  - Used results from above sources to locate candidate wells and springs
    - Availability/Access, Screened intervals, Casing type and diameter
  - Broadened baseline from locations previously sampled, by including some of the wells drilled by Nye County as part of past scientific characterization programs

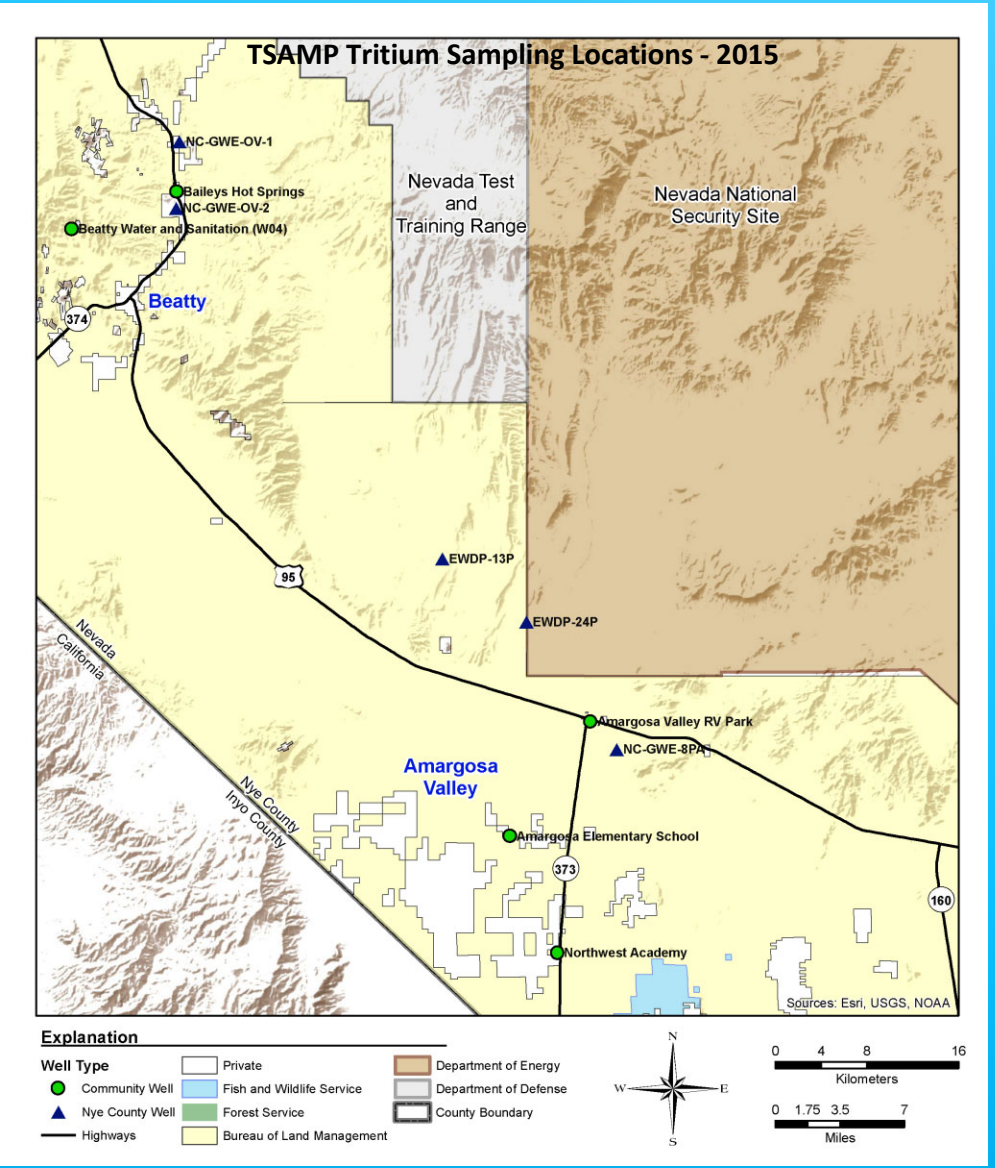
Core Well Sampling Results (2015-2022)

- Established 10 core wells in 2015
  - Core wells are sampled every year and considered to be of highest sampling priority
    - Amargosa Elementary School*
    - Amargosa Valley RV Park
    - Baileys Hot Springs
    - Beatty Water and Sanitation (W04)
    - EWDP-13P
    - EWDP-24P
    - GWE-OV-1
    - GWE-OV-2
    - GWE-8PA
    - Northwest Academy**
  - Test results showed all 10 core wells had undetectable levels of tritium in 2015 - 2022***

* Well abandoned and replaced by "Amargosa Elementary School-2" in 2019

** Location renamed "Never Give Up" in 2019

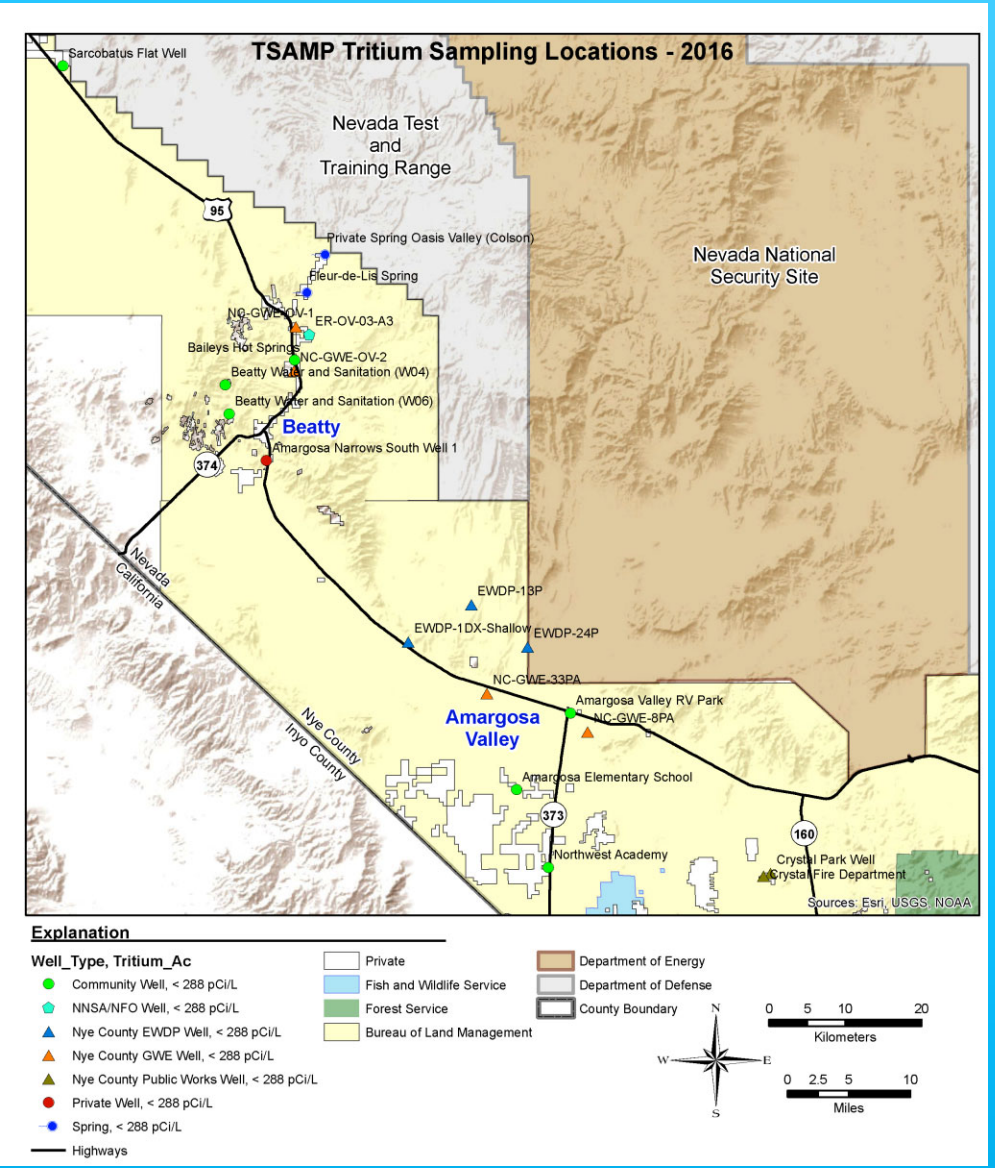
*** RSE is using EPA-approved, unenriched scintillation counting method with MDCs of approximately 300 pCi/L



2016 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Narrows South Well 1
    - Beatty Water and Sanitation (W06)
    - Crystal Fire Department
    - Crystal Park Well
    - EWDP-1DX-Shallow
    - ER-OV-03-A3 *
    - Fleur-de-Lis Spring
    - GWE-33PA
    - Private Spring Oasis Valley (Colson)
    - Sarcobatus Flat Well
  - Test results showed all 20 sample locations had undetectable levels of tritium

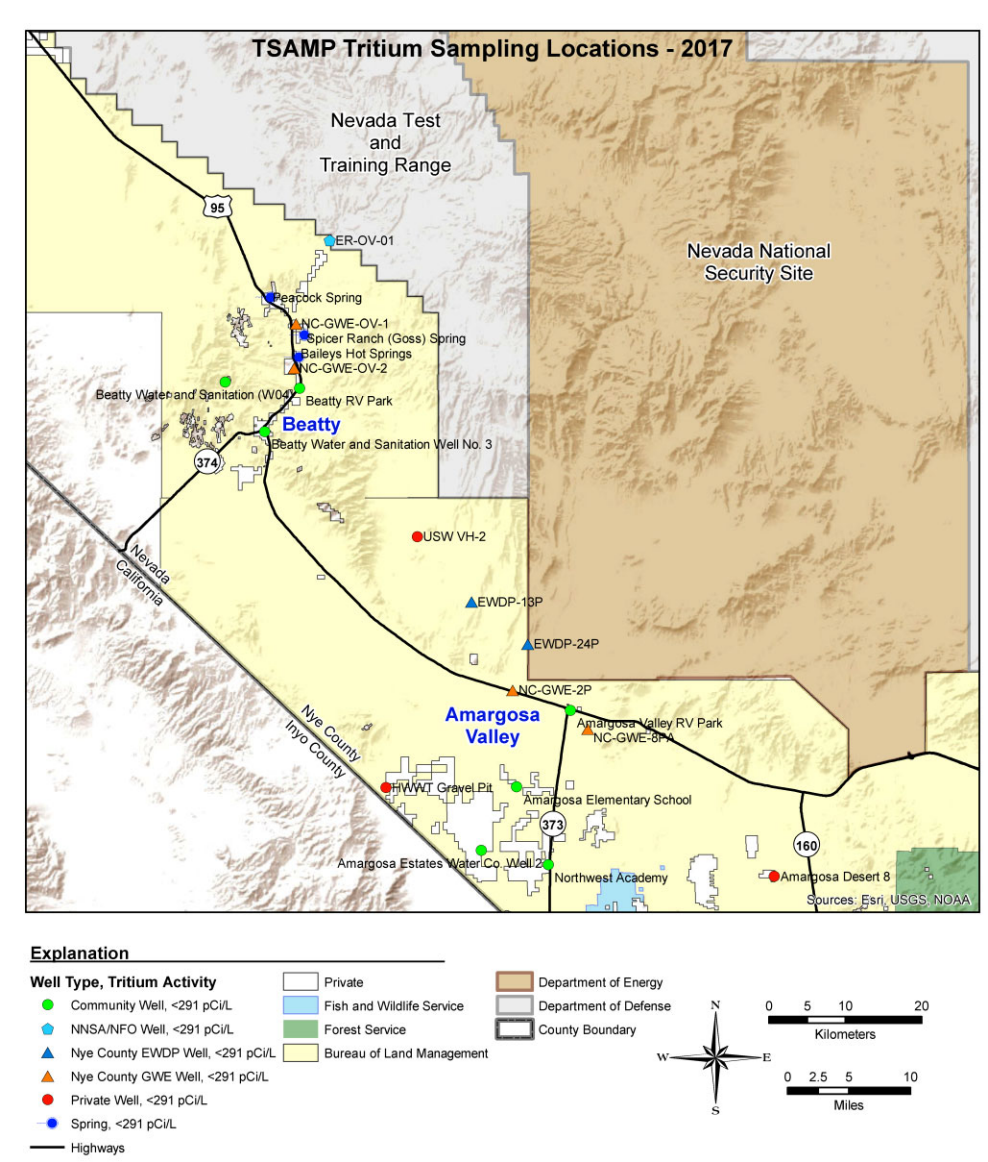
*Nye Co. started sampling ER-OV wells in 2016



2017 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Desert 8
    - Amargosa Estates Water Co. Well 2
    - Beatty RV Park
    - Beatty Water and Sanitation Well No. 3*
    - ER-OV-01
    - HWWT Gravel Pit
    - NC-GWE-2P
    - Peacock Spring*
    - Spicer Ranch (Goss) Spring
    - USW VH-2
  - Test results showed all 20 sample locations had undetectable levels of tritium

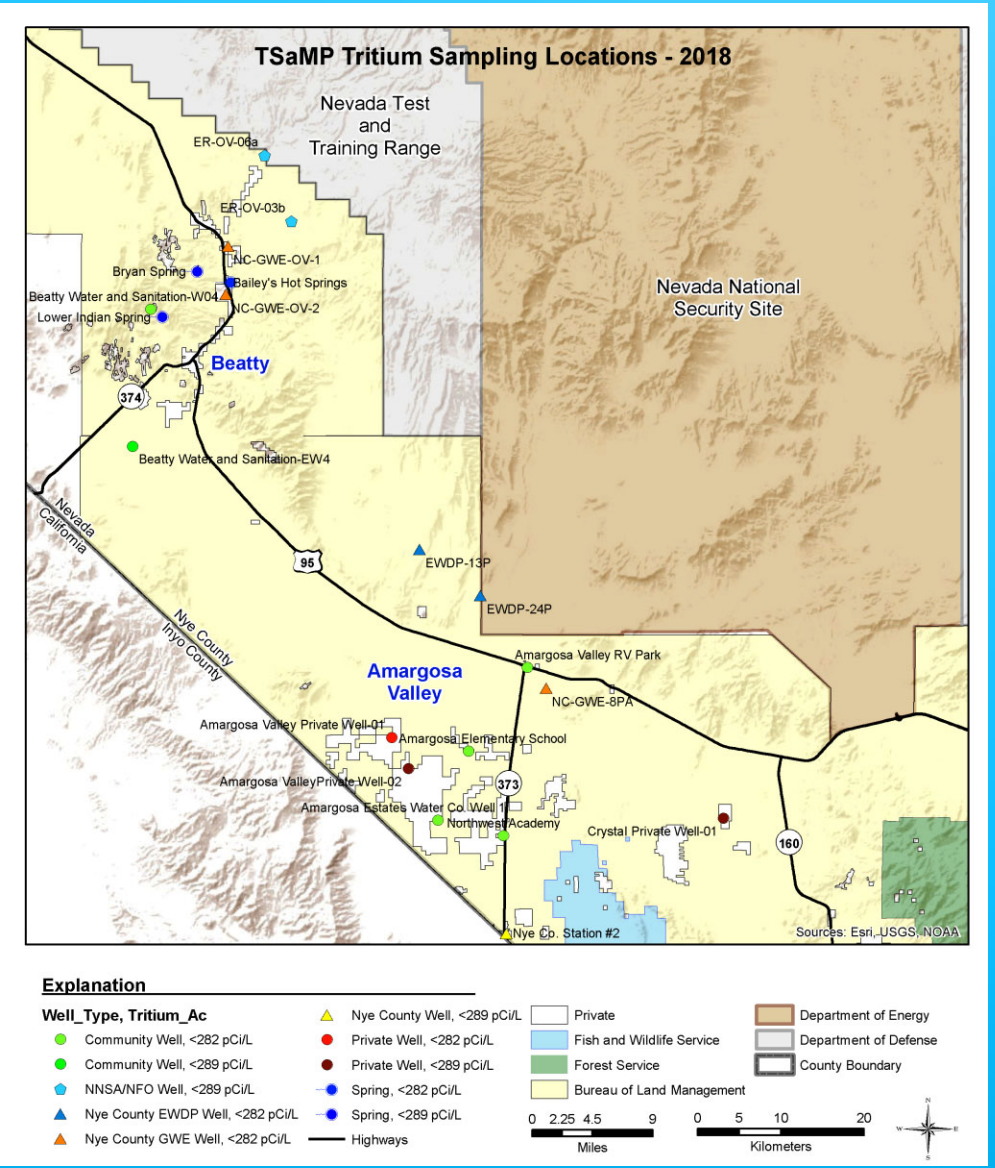
* Joint sampling effort with NSTec Ecological & Environmental Monitoring



2018 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Estates Water Co. Well 1
    - Amargosa Valley Private Well-01 *
    - Amargosa Valley Private Well-02-wellhead*
    - Beatty Water and Sanitation Well EW4
    - Bryan Spring
    - Crystal Private Well-01 *
    - ER-OV-03b
    - ER-OV-06a
    - Lower Indian Spring
    - Nye Co. Station #2
  - Test results showed all 20 sample locations had undetectable levels of tritium

* Private well sample – new starting in 2018 with sequential number assigned for each area (Beatty, Amargosa, and Crystal)



2019 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-03
    - Amargosa Valley Private Well-04
    - Amargosa Valley USPS
    - Beatty Water and Sanitation Well 1
    - Cave Spring
    - ER-OV-02
    - ER-OV-03a3
    - EWDP-7S
    - NC-GWE-Felderhoff-25-1PA
    - Revert Springs*
  - Test results showed all 20 sample locations had undetectable levels of tritium

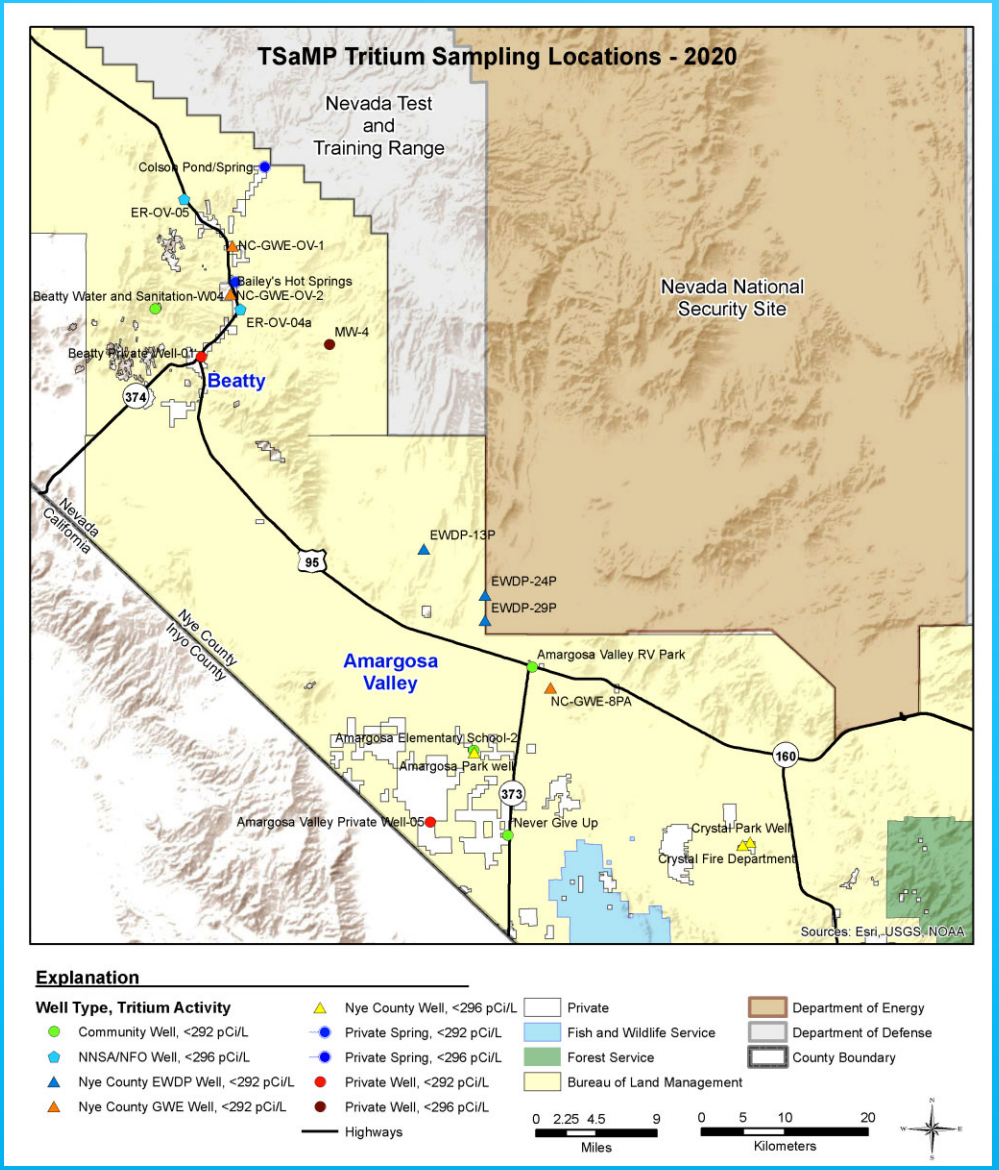
* Joint sampling effort with NSTec Ecological & Environmental Monitoring

2020 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Park well
    - Amargosa Valley Private Well-05
    - Beatty Private Well -01
    - Colson Pond/Spring**
    - Crystal Fire Department**
    - Crystal Park Well*′**
    - ER-OV-04a
    - ER-OV-05
    - EWDP-29P
    - MW-4
  - Test results showed all 20 sample locations had undetectable levels of tritium

* Joint sampling effort with NSTec Ecological & Environmental Monitoring

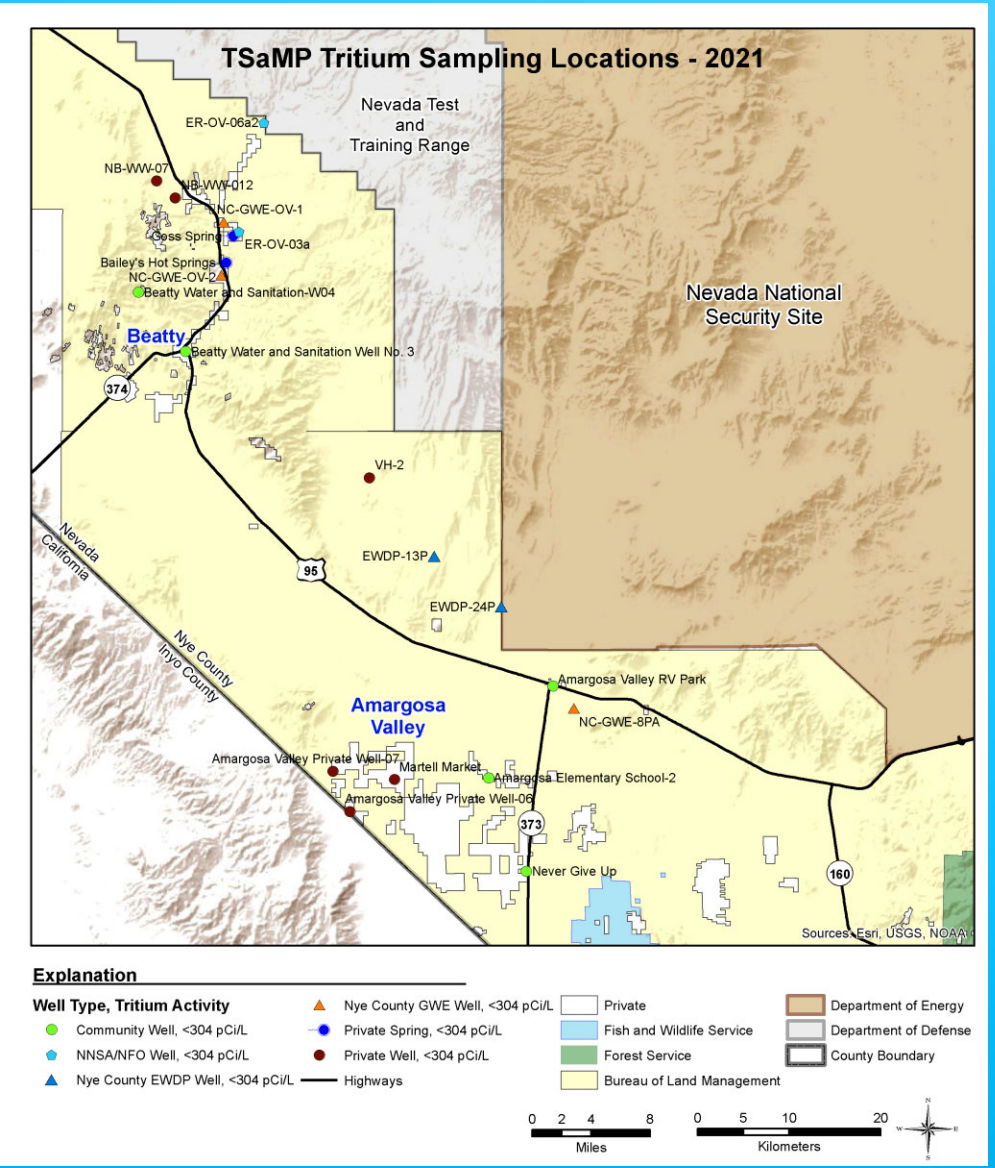
* * 4-year resampling of previously selected wells – new starting in 2220



2021 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-06
    - Amargosa Valley Private Well-07
    - Beatty Water and Sanitation
      - Well No. 3**
    - ER-OV-03a
    - ER-OV-06a2
    - Goss Spring**
    - Martell Market
    - NB-WW-07
    - NB-WW-12
    - VH-2**
  - Test results showed all 20 sample locations had undetectable levels of tritium

* * 4-year resampling of previously selected wells



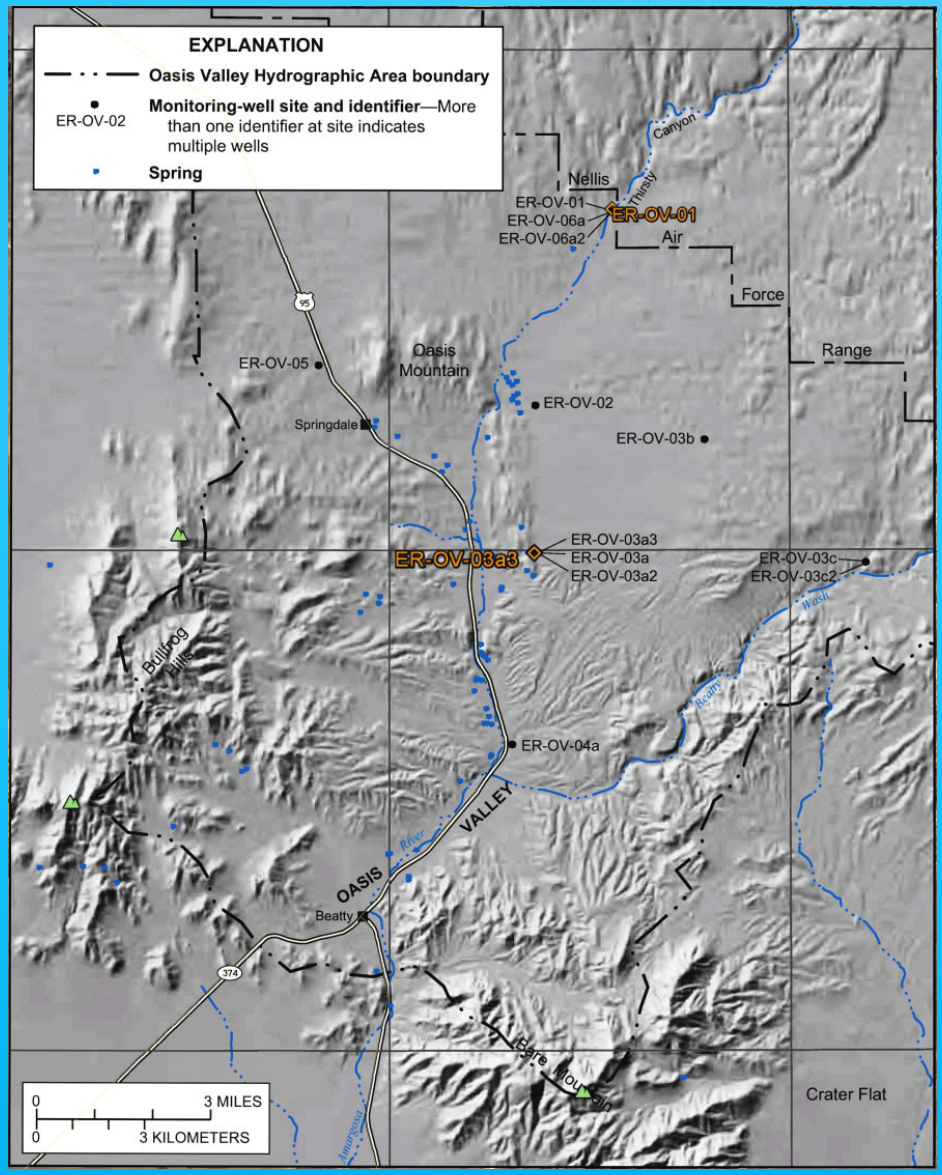
2022 Sampling Results

- 20 sample locations
  - 10 core well locations; plus
    - Amargosa Valley Private Well-08
    - Amargosa Valley Private Well-09
    - Amargosa Valley Private Well-10
    - Beatty Water and Sanitation Well – EW4**
    - Bryan Spring**
    - Cind-R-Lite Well *
    - Crystal Springs
    - ER-OV-03b**
    - ER-OV-03c
    - ER-OV-03c2
  - Test results showed all 20 sample locations had undetectable levels of tritium

* Joint sampling effort with NSTec Ecological & Environmental Monitoring

* * 4-year resampling of previously selected wells

ER-OV Wells
(DOE EM NV UGTA Wells)



* Image from USGS WRIR 98-4184

- Wells are NE of Beatty and downgradient from Pahute Mesa
- Adds flexibility to TSaMP program and allows for a coordinated joint sampling effort with DRI
- Nye County will continue sampling at least one ER-OV well each year

DOE : United States Department Of Energy
EM NV: Office of Environmental Management Nevada Program
UGTA: Underground Test Area program

ER-OV Wells - cont

(DOE EM NV UGTA Wells)

ER-OV wells sampled

- ER-OV-01 (2017)
- ER-OV-02 (2019)
- ER-OV-03a (2021)
- ER-OV-03a3 (2016, 2019)
- ER-OV-03b (2018, 2022)
- ER-OV-03c (2022)
- ER-OV-03c2 (2022)
- ER-OV-04a (2020)
- ER-OV-05 (2020)
- ER-OV-06a (2018)
- ER-OV-06a2 (2021)

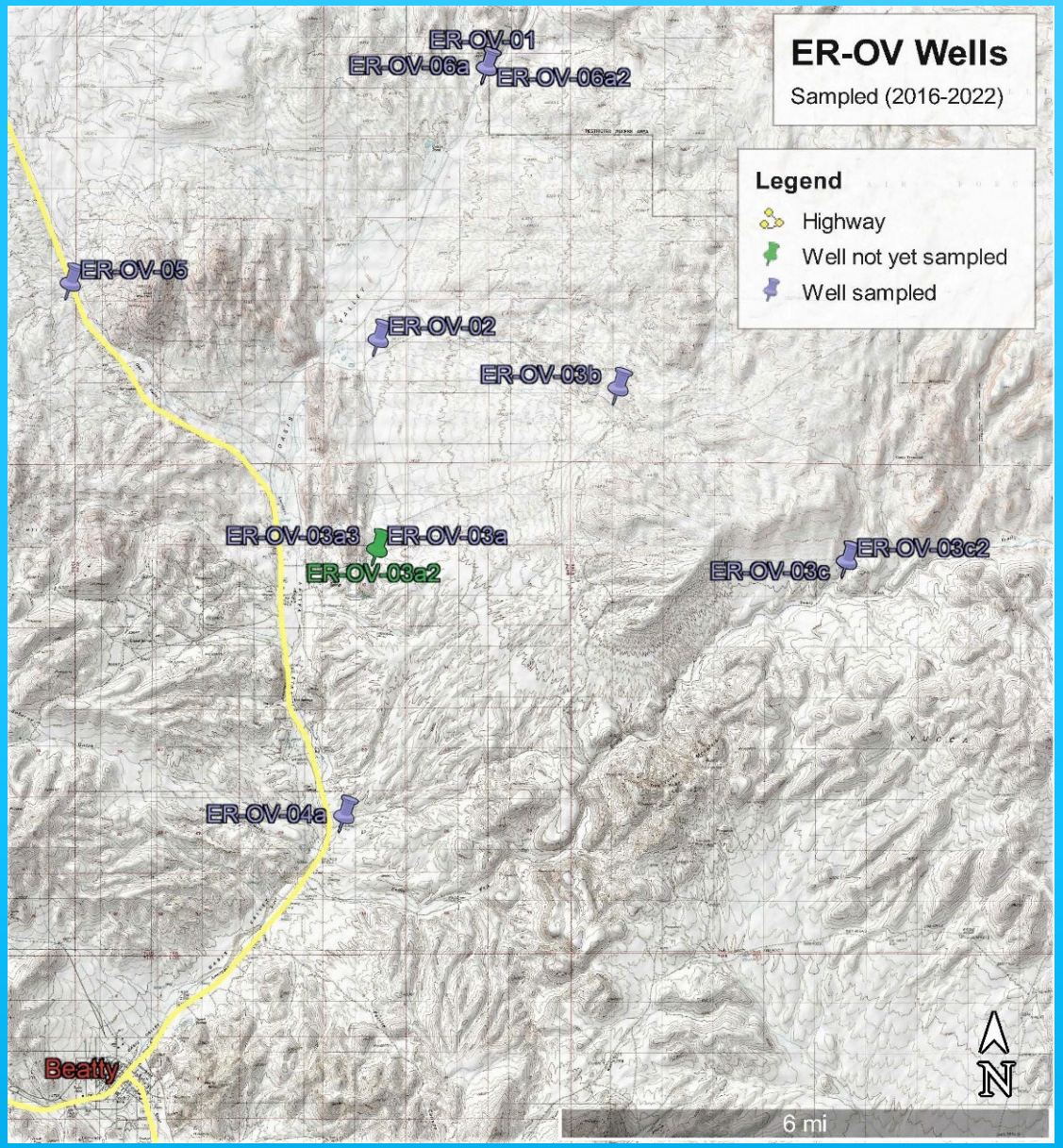
ER-OV wells not yet sampled

- ER-OV-03a2 (2023?)

*ER-OV-03a2 will most likely not be sampled because of the long purge time (6 hr. 45 min.), and information from the USGS indicating the well is not in good communication with the formation.

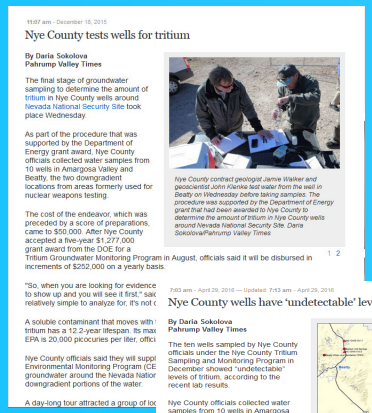
* Nye County will continue to sample at least one ER-OV well each year.

DOE : United States Department Of Energy
EM NV: Office of Environmental Management Nevada Program
UGTA: Underground Test Area program



Public Outreach

- TSaMP presentation given at the May 20, 2020, NSSAB meeting
- Featured in DOE EM Update Newsletter, June 30, 2020
- Articles run in local newspaper (PVT) 2015 – 2021
- Supplied sampling locations and results for inclusion in the NNSSER 2015 – 2022*
- Presented poster at DOE Groundwater Open House meetings in Amargosa- 2016, 2019, and 2022
- Tour for the NSSAB and CEM's – 2015


Nye County tests wells for tritium

By Daria Sokolova
Pahrump Valley Times

The final stage of groundwater sampling to determine the amount of tritium in Nye County wells around Nevada National Security Site took place Wednesday.

As part of the procedure that was supported by the Department of Energy grant award, Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty, the two downgradient locations from areas formerly used for nuclear weapons testing.

The cost of the endeavor, which was preceded by a score of preparations, came to $50,000. After Nye County accepted a five-year $1,277,000 grant award from the DOE for a Tritium Groundwater Monitoring Program in August, officials said it will be disbursed in increments of $252,000 on a yearly basis.

"So, when you are looking for evidence to show up and you will see it first," said relatively simple to analyze for, it's not c

A soluble contaminant that moves with tritium has a 12.2-year lifespan. Its ma EPA is 20,000 picocuries per liter; offici

Nye County officials said they will suppl Environmental Monitoring Program (CE groundwater around the Nevada Natior downgradient portions of the water.

A day-long tour attracted a group of loc

Nye County contract geologist Jamie Walker and geoscientist John Klenke test water from the well in Beatty on Wednesday before taking samples. The procedure was supported by the Department of Energy grant that had been awarded to Nye County to determine the amount of tritium in Nye County wells around Nevada National Security Site. Daria Sokolova/Pahrump Valley Times

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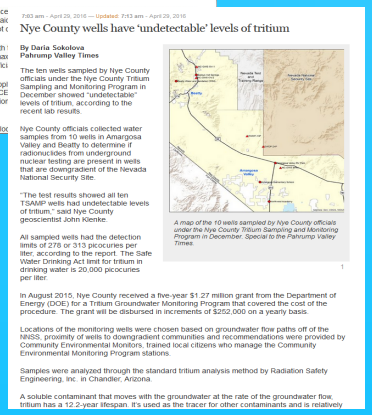

Nye County wells have 'undetectable' levels of tritium

By Daria Sokolova
Pahrump Valley Times

The ten wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December showed "undetectable" levels of tritium, according to the recent lab results.

Nye County officials collected water samples from 10 wells in Amargosa Valley and Beatty to determine if radionuclides from underground nuclear testing are present in wells that are downgradient of the Nevada National Security Site.

"The test results showed all ten TSAMP wells had undetectable levels of tritium," said Nye County geoscientist John Klenke.

All sampled wells had the detection limits of 278 or 313 picocuries per liter, according to the report. The Safe Water Drinking Act limit for tritium in drinking water is 20,000 picocuries per liter.

A map of the 10 wells sampled by Nye County officials under the Nye County Tritium Sampling and Monitoring Program in December. Special to the Pahrump Valley Times

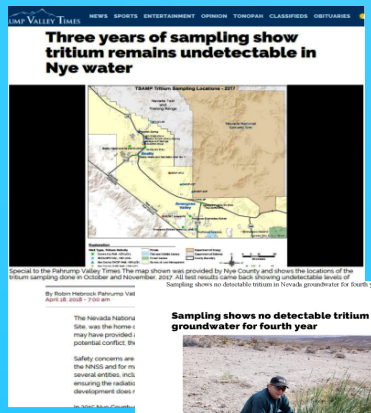
1

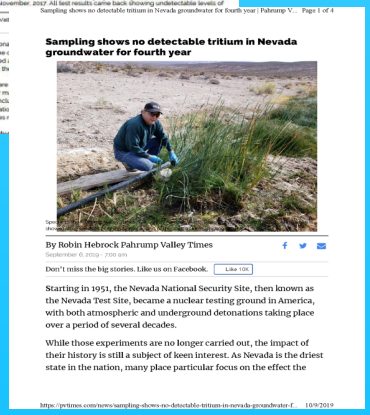
In August 2015, Nye County received a five-year $1.27 million grant from the Department of Energy (DOE) for a Tritium Groundwater Monitoring Program that covered the cost of the procedure. The grant will be disbursed in increments of $252,000 on a yearly basis.

Locations of the monitoring wells were chosen based on groundwater flow paths off of the NNSS, proximity of wells to downgradient communities and recommendations were provided by Community Environmental Monitors, trained local citizens who manage the Community Environmental Monitoring Program stations.

Samples were analyzed through the standard tritium analysis method by Radiation Safety Engineering, inc. in Chandler, Arizona.

A soluble contaminant that moves with the groundwater at the rate of the groundwater flow, tritium has a 12.2-year lifespan. It's used as the tracer for other contaminants and is relatively


Three years of sampling show tritium remains undetectable in Nye water


Sampling shows no detectable tritium in Nevada groundwater for fourth year

By Robin Hebrock Pahrump Valley Times

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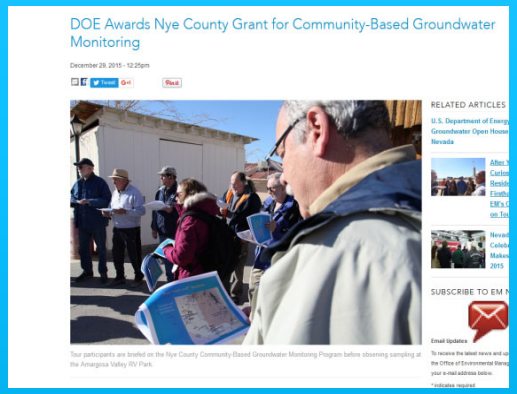
Starting in 1951, the Nevada National Security Site, then known as the Nevada Test Site, became a nuclear testing ground in America, with both atmospheric and underground detonations taking place over a period of several decades.

While those experiments are no longer carried out, the impact of their history is still a subject of keen interest. As Nevada is the driest state in the nation, many place particular focus on the effect the

https://pvtimes.com/news/sampling-shows-no-detectable-tritium-in-nevada-groundwater-f... 10/9/2019


DOE Awards Nye County Grant for Community-Based Groundwater Monitoring

December 29, 2015 - 12:25pm

RELATED ARTICLES

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Email Updates

Tour participants are briefed on the Nye County Community-Based Groundwater Monitoring Program before observing sampling at the Amargosa Valley RV Park.

* Report in progress

Quality Assurance

- Nye County coordinates sampling efforts through Quality Assurance Officer (QAO)
- Nye County conducts annual internal audits to ensure integrity of TSaMP data
  - Audit conducted by qualified professional (QAO)
  - Field surveillances
  - Office surveillances
  - Reports submitted to NWRPO /NRFF
- Navarro conducted an independent assessment of TSaMP (11/5/18 - 12/12/18) and made four observations.
  - Nye County addressed observations and updated it's QA documentation (WP-11, TPN 11.8, TP-11.2, and HASP).

December 18, 2016

Darrell Lacy, Director
Nye County TSAMP Project Director
250 N. Hwy 160 #1
Pahrump, NV 89060

Nye County TSAMP Internal Audit Report, TSAMP-2016-01

Enclosed please find the TSAMP internal audit report, TSAMP-2016-01, conducted December 5-7, 2016. Included in the audit report are 3 observations and 1 finding that were made during the audit along with suggested corrective actions and recommendations. The finding was addressed during the audit, and all data packages will be submitted in a timely manner. If you have any questions please let me know or you can also refer to QAP-18.1.

Regards,

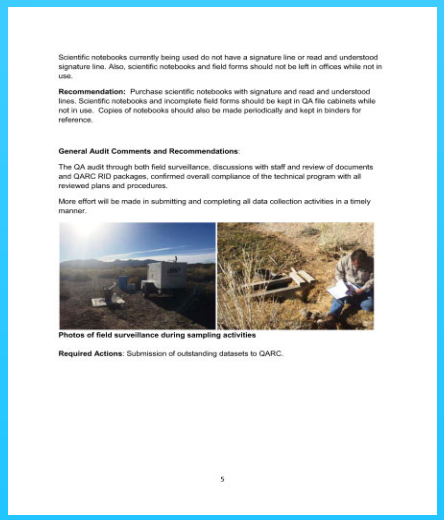
Kathy Gilmore

Quality Assurance Officer

Cc: John Klenke
Celeste Sandoval/QARC

Attachments: Audit Report and Audit Checklist

1



Scientific notebooks currently being used do not have a signature line or read and understood signature line. Also, scientific notebooks and field forms should not be left in offices while not in use.

Recommendation: Purchase scientific notebooks with signature and read and understood lines. Scientific notebooks and incomplete field forms should be kept in QA file cabinets while not in use. Copies of notebooks should also be made periodically and kept in binders for reference.

General Audit Comments and Recommendations:

The QA audit through both field surveillance, discussions with staff and review of documents and QARC RID packages, confirmed overall compliance of the technical program with all reviewed plans and procedures.

More effort will be made in submitting and completing all data collection activities in a timely manner.

Photos of field surveillance during sampling activities

Required Actions: Submission of outstanding datasets to QARC.

5

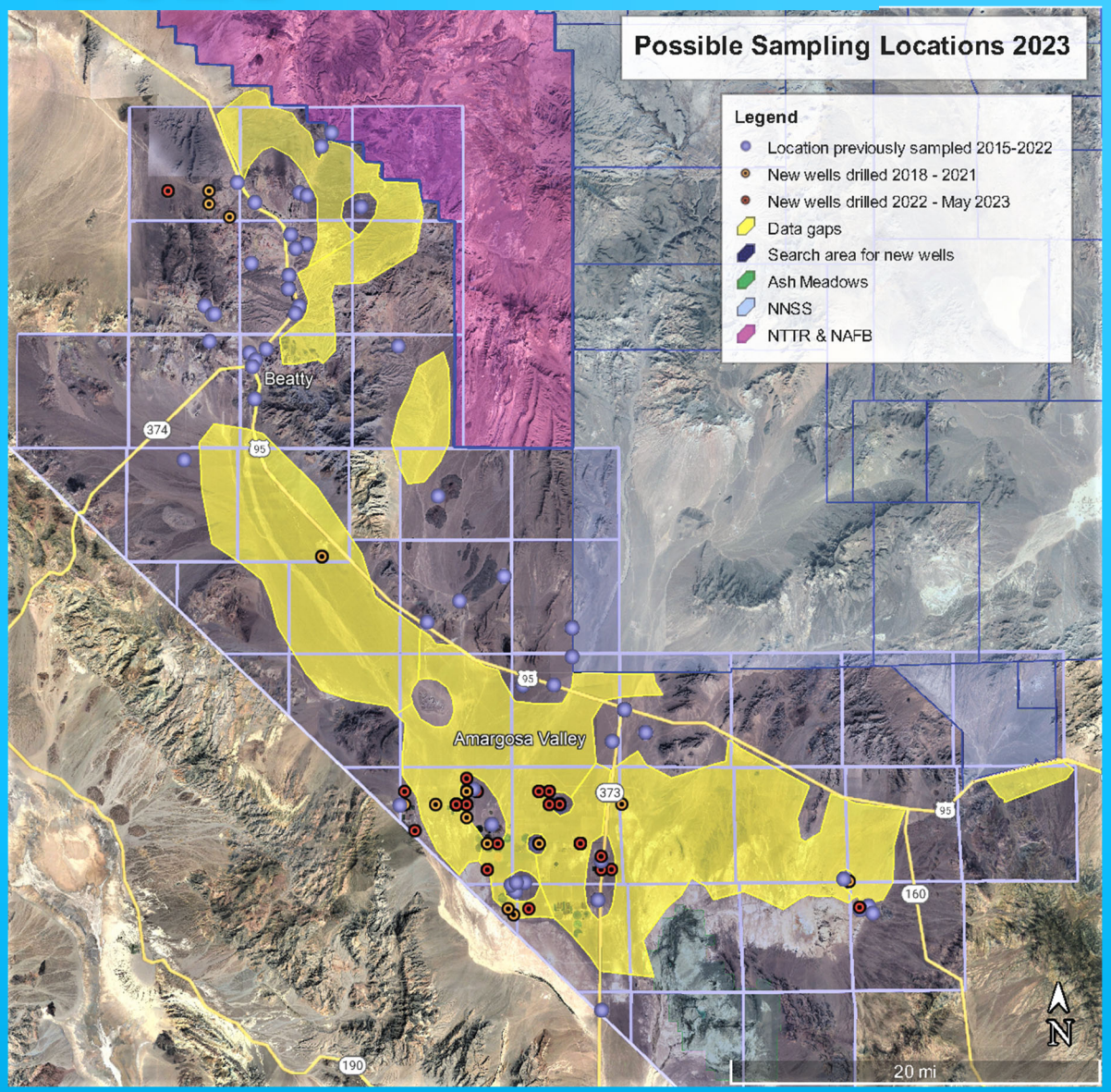
Town Board Meetings

- TSaMP presentations were given at Beatty Town Board meetings on 9/25/17, and 11/4/19; and at Amargosa Town Board meetings on 9/27/17, and 11/21/19
- 2017 presentations resulted in three new sampling locations for 2017, and several potential new sites for future years.
- 2019 presentations resulted in one new sampling location for 2019, one for 2020, one for 2021, and five potential new sites for future years.
- Nye County will give presentations at Town Board Meetings in the future if requested by the boards, or if needed to supplement potential sampling locations.

Possible Sampling Locations 2023

Map showing location of newly drilled wells downgradient of the NNSS

- Locations TSaMP previously sampled for tritium (2015 to 2022) shown as gray dots
- Dark outline show area of search for new wells (in NDWR database)
- Yellow areas indicate areas of data gaps in TSaMP program
- Newly drilled (2018 to 2021) shown as orange circles
- Newly drilled (2022 to May 2023) shown as red circles



Possible Sampling Locations 2023 -cont

- What are the priorities for well sampling locations?
  - Wells used by communities?
  - Wells that provide early detection but may not be potable water sources?
- What wells or other locations do members of public consider to be of highest priority?
- What locations do you feel should be sampled?
  - 2023
- When making your individual recommendation, please consider:
  - Past sampling results
    - Identified flow paths and historic sampling results
    - Age of water (Tritium half-life = 12.32 yrs – less than 1% remaining after 7 half-lives (86 yrs)
- Would you like to participate in the water sampling?
- We welcome any participation!

Questions?

Contact Information:
John Klenke
Geoscientist III
jklenke@nyecountynv.gov
Office: 775-727-4354