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Sent: Wednesday, September 28, 2022 3:32 PM
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Subject: K-Area Groundwater Sample Data Trends

SRNS-J2600-2022-00406

Reference: Pre-Workplan Characterization Data Reporting for the K-Area Groundwater Operable Unit (OU) (including K-Area Tritium Anomaly) (NBN), CERCLIS Number: 99 (IACD-15-144, dated May 14, 2015)

As part of the pre-workplan characterization for K-Area Groundwater Operable Unit, a subset of wells and surface water locations are used to monitor tritium and volatile organic compound concentrations. This includes five (5) K-Area Disassembly Basin wells (KDB series) and well KRB 19D, located near the Containment (Retention) Basin (904-88G). A total of seven (7) surface water locations are also monitored with five (5) of them situated along Indian Grave Branch and the remaining two (2) farther downstream in Pen Branch.

As determined in the April 22, 2015 Core Team webcast meeting and documented in the reference listed above, DOE agreed that the Core Team will convene to discuss anomalous trends in monitoring data provided one of the following conditions were encountered:

- > 25% increase in concentration of tritium at surface water sample locations KSW-17 and KSW-18 over a two-year period
- > 50% increase in concentration of tritium at all other sample locations over a two-year period, and
- Exceedance of any VOC MCL in surface water.

Based on a conservative interpretation of this criteria, SRS is notifying the Core Team that there are indications of an increasing trend of greater than 50% for two monitoring wells (KDB-2 at 190 pCi/mL and KDB-5 at 49 pCi/mL) and ~~greater than 25%~~ at one surface water station (KSW-05 at 90.8 pCi/mL), and greater than 25% at two additional surface water stations (KSW-17 at 10.8 pCi/mL and KDB-18 at 8.47 pCi/mL) in the K-Area tritium plume within the last two-year period (2020 – 2022).

As shown in the attachment (Figure 1, K-Area Tritium Plume 1Q22), the two monitoring wells are close to the source of the identified tritium plume emanating from the 105-K reactor building. All other groundwater monitoring wells in the tritium plume continue to show concentrations within the acceptable range of variability. Surface water station KSW-05 also exceeded the 50% increase over a two-year period which is likely attributable to plume migration from the containment basin/area downgradient of ~~near~~ well KRB 19D (which has displayed continued decreases in tritium concentration).

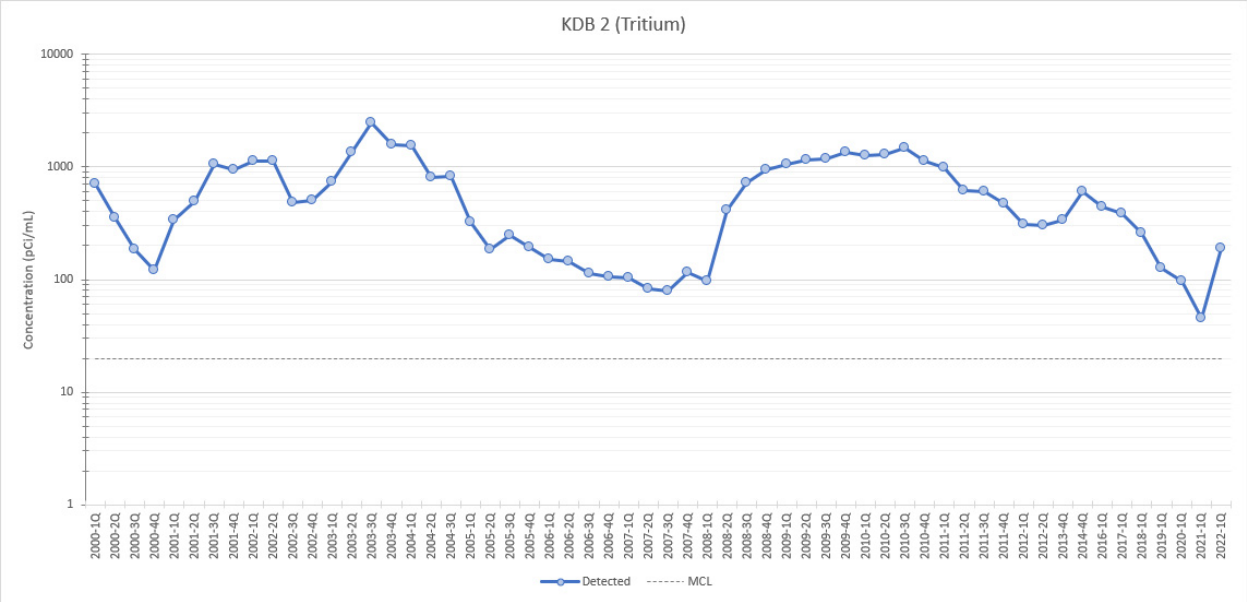
Although both KSW-17 and KSW-18 have shown an increase in tritium concentration above the 25% notification threshold, these slightly higher concentrations are below the MCL and are below the maximum reported past concentrations at both locations. Also of note is that the surface water sampling stations downgradient within Pen Branch have exhibited some reduced flow over the last two years, which contributes to slighter higher tritium concentrations.

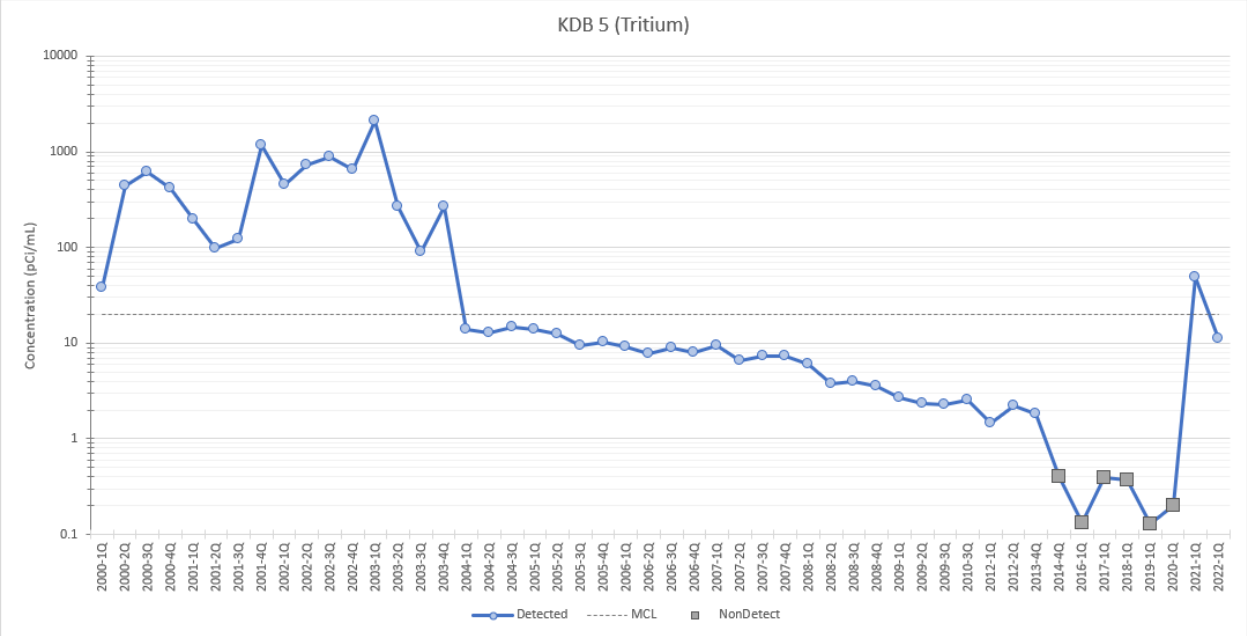
There have been no exceedances of VOC MCLs in surface water sampling stations.

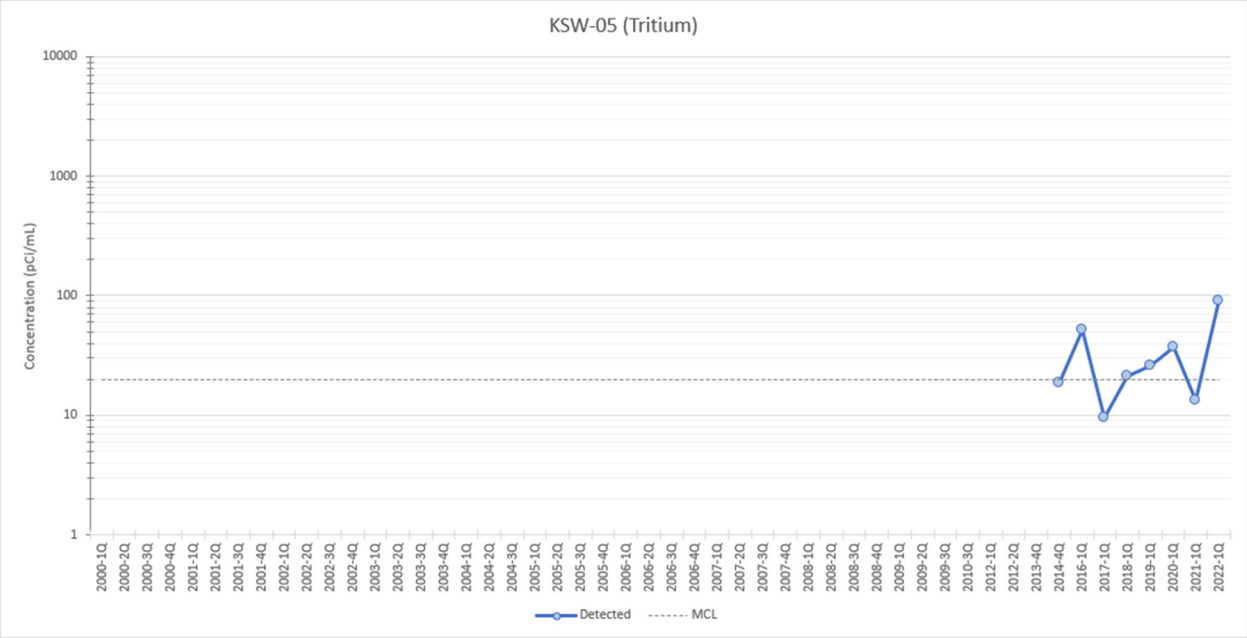
The following table and time series plots summarize the most recent tritium sampling data for monitoring wells KDB-2 and KDB-5, surface water station KSW-05, as well as the increase in concentrations at KSW-17 and KSW-18.

	1Q2020	**1Q2021**	**1Q2022**
KDB-2	96.2 pCi/mL	45.5 pCi/mL	**190** pCi/mL
KDB-5	0.2 pCi/mL	**49** pCi/mL	11.2 pCi/mL
KSW-05	37.3 pCi/mL	13.2 pCi/mL	**90.8** pCi/mL
KSW-17	8.29 pCi/mL	8.78 pCi/mL	**10.8 pCi/mL**
KSW-18	5.81 pCi/mL	7.02 pCi/mL	**8.47 pCi/mL**

bolded values meets conditions for notification


KDB 2 (Tritium)
Concentration (pCi/mL)
10000
1000
100
10
1
2000-1Q
2000-2Q
2000-3Q
2000-4Q
2001-1Q
2001-2Q
2001-3Q
2001-4Q
2002-1Q
2002-2Q
2002-3Q
2002-4Q
2003-1Q
2003-2Q
2003-3Q
2003-4Q
2004-1Q
2004-2Q
2004-3Q
2005-1Q
2005-2Q
2005-3Q
2005-4Q
2006-1Q
2006-2Q
2006-3Q
2006-4Q
2007-1Q
2007-2Q
2007-3Q
2007-4Q
2008-1Q
2008-2Q
2008-3Q
2008-4Q
2009-1Q
2009-2Q
2009-3Q
2009-4Q
2010-1Q
2010-2Q
2010-3Q
2010-4Q
2011-1Q
2011-2Q
2011-3Q
2011-4Q
2012-1Q
2012-2Q
2013-4Q
2014-4Q
2016-1Q
2017-1Q
2018-1Q
2019-1Q
2020-1Q
2021-1Q
2022-1Q
Detected
MCL


KDB 5 (Tritium)
Concentration (pCi/mL)
10000
1000
100
10
1
0.1
2000-1Q
2000-2Q
2000-3Q
2000-4Q
2001-1Q
2001-2Q
2001-3Q
2001-4Q
2002-1Q
2002-2Q
2002-3Q
2002-4Q
2003-1Q
2003-2Q
2003-3Q
2003-4Q
2004-1Q
2004-2Q
2004-3Q
2005-1Q
2005-2Q
2005-3Q
2005-4Q
2006-1Q
2006-2Q
2006-3Q
2006-4Q
2007-1Q
2007-2Q
2007-3Q
2007-4Q
2008-1Q
2008-2Q
2008-3Q
2008-4Q
2009-1Q
2009-2Q
2009-3Q
2010-3Q
2012-1Q
2012-2Q
2013-4Q
2014-4Q
2016-1Q
2017-1Q
2018-1Q
2019-1Q
2020-1Q
2021-1Q
2022-1Q
Detected
MCL
NonDetect


KSW-05 (Tritium)
Concentration (pCi/mL)
10000
1000
100
10
1
2000-1Q
2000-2Q
2000-3Q
2000-4Q
2001-1Q
2001-2Q
2001-3Q
2001-4Q
2002-1Q
2002-2Q
2002-3Q
2002-4Q
2003-1Q
2003-2Q
2003-3Q
2003-4Q
2004-1Q
2004-2Q
2004-3Q
2005-1Q
2005-2Q
2005-3Q
2005-4Q
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2006-2Q
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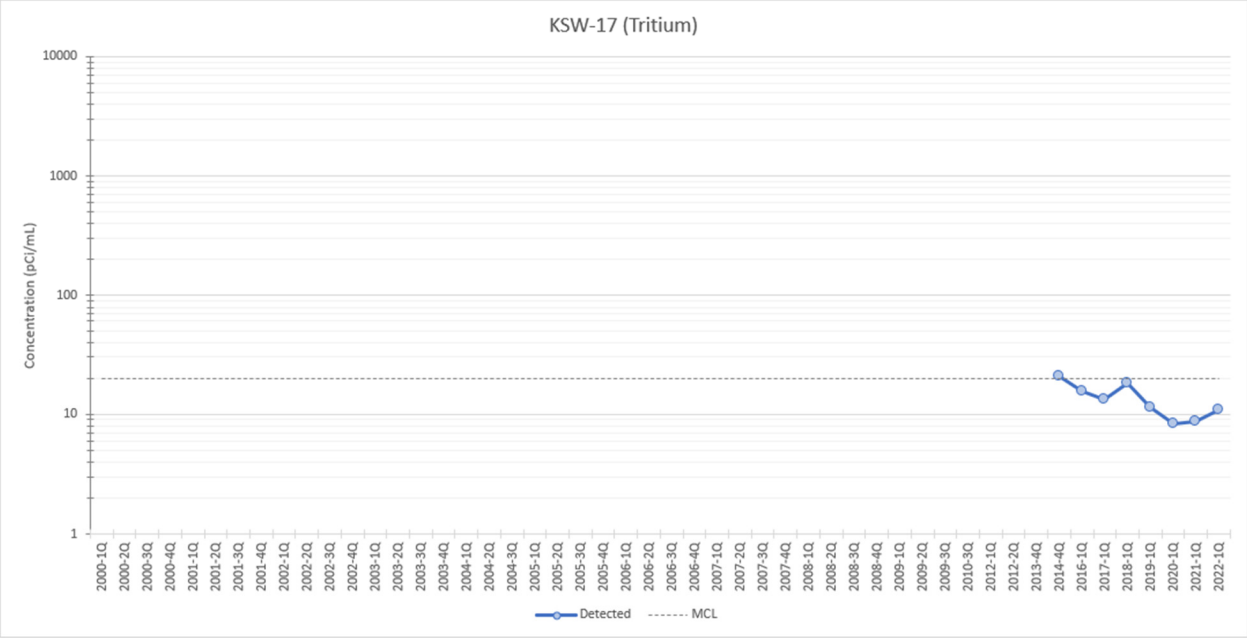
2006-4Q
2007-1Q
2007-2Q
2007-3Q
2007-4Q
2008-1Q
2008-2Q
2008-3Q
2008-4Q
2009-1Q
2009-2Q
2009-3Q
2010-3Q
2012-1Q
2012-2Q
2013-4Q
2014-4Q
2016-1Q
2017-1Q
2018-1Q
2019-1Q
2020-1Q
2021-1Q
2022-1Q
Detected
MCL


KSW-17 (Tritium)
Concentration (pCi/mL)
10000
1000
100
10
1
2000-1Q
2000-2Q
2000-3Q
2000-4Q
2001-1Q
2001-2Q
2001-3Q
2001-4Q
2002-1Q
2002-2Q
2002-3Q
2002-4Q
2003-1Q
2003-2Q
2003-3Q
2003-4Q
2004-1Q
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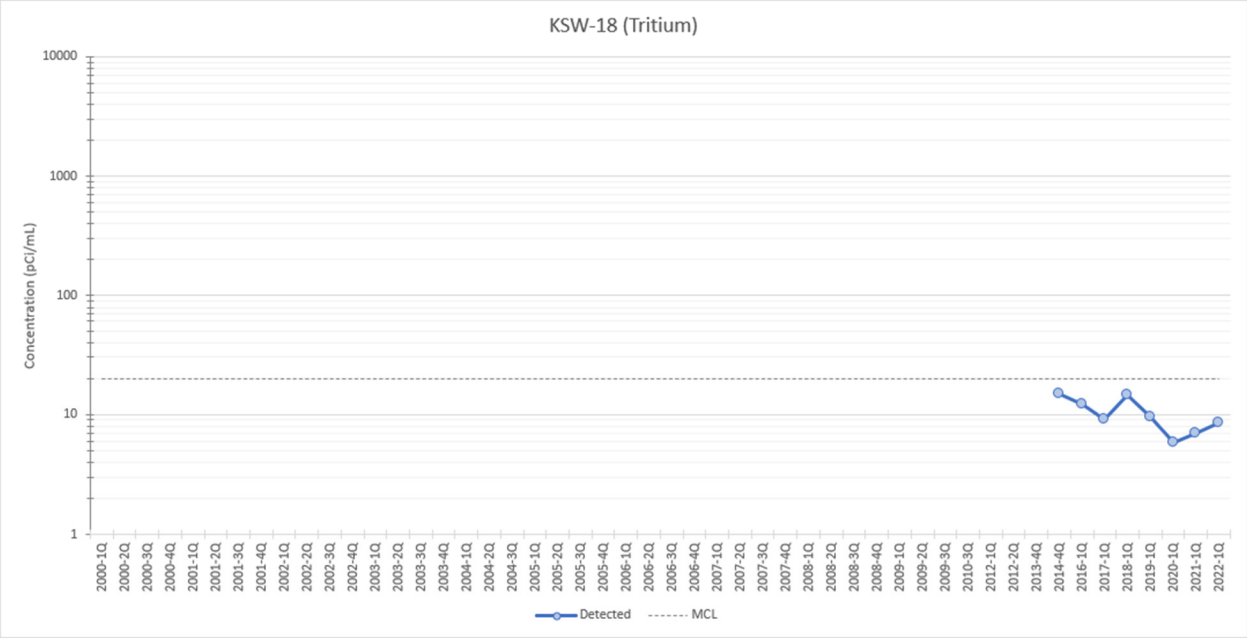
2005-4Q
2006-1Q
2006-2Q
2006-3Q
2006-4Q
2007-1Q
2007-2Q
2007-3Q
2007-4Q
2008-1Q
2008-2Q
2008-3Q
2008-4Q
2009-1Q
2009-2Q
2009-3Q
2010-3Q
2012-1Q
2012-2Q
2013-4Q
2014-4Q
2016-1Q
2017-1Q
2018-1Q
2019-1Q
2020-1Q
2021-1Q
2022-1Q
Detected
MCL



Hydrographs for monitoring wells KDB-2 and KDB-5 show some increase in water elevations over the last few years during which the tritium trend data (i.e., time series plots) show a spike in both wells. As noted earlier, surface water locations KSW-17 and KSW-18 have shown an increase in tritium concentrations over the previous two-year period but remain below concentrations observed in 2015 – 2018. Although the KSW-05 tritium trend since 2015 is increasing, monitoring well KRB-19D continues to decrease, as shown in trend data within the *5-Year Monitoring Report (Data Summary Letter) for the K-Area Groundwater Operable Unit, 2016 through 2020*, IACD-20-182, September 2020.

In summary, wells that are trending upward greater than 50% in concentration are near the source of the K-Area Complex reactor building, and surface water station KSW-05 is downgradient of the higher concentrations found at monitoring well KRB 19D (that have significantly decreased over time). In addition, surface water stations in general have not exhibited any continuous upward trend or significant increases that would suggest an increase in the flux of contaminant or additional sources. The proposal therefore is to continue monitoring the plume on its' current schedule and if surface water concentrations continue to increase in 1Q23 a Core Team meeting can be considered**.** Since the next 5 year KAGW monitoring report is due in 2025 (two more sampling events), SRS suggests that the Core Team discussion of these anomalies in comparison to the future 2023 and 2024 data be deferred until after the 2025 *5-Year Monitoring Report* is issued.

As always, further discussions can be committed to within this calendar year if warranted by the Core Team. Please let us know.

Please call me if you have any questions.

Thanks

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