

Dawn Mill and the Spokane Tribe

BRIAN CROSSLEY

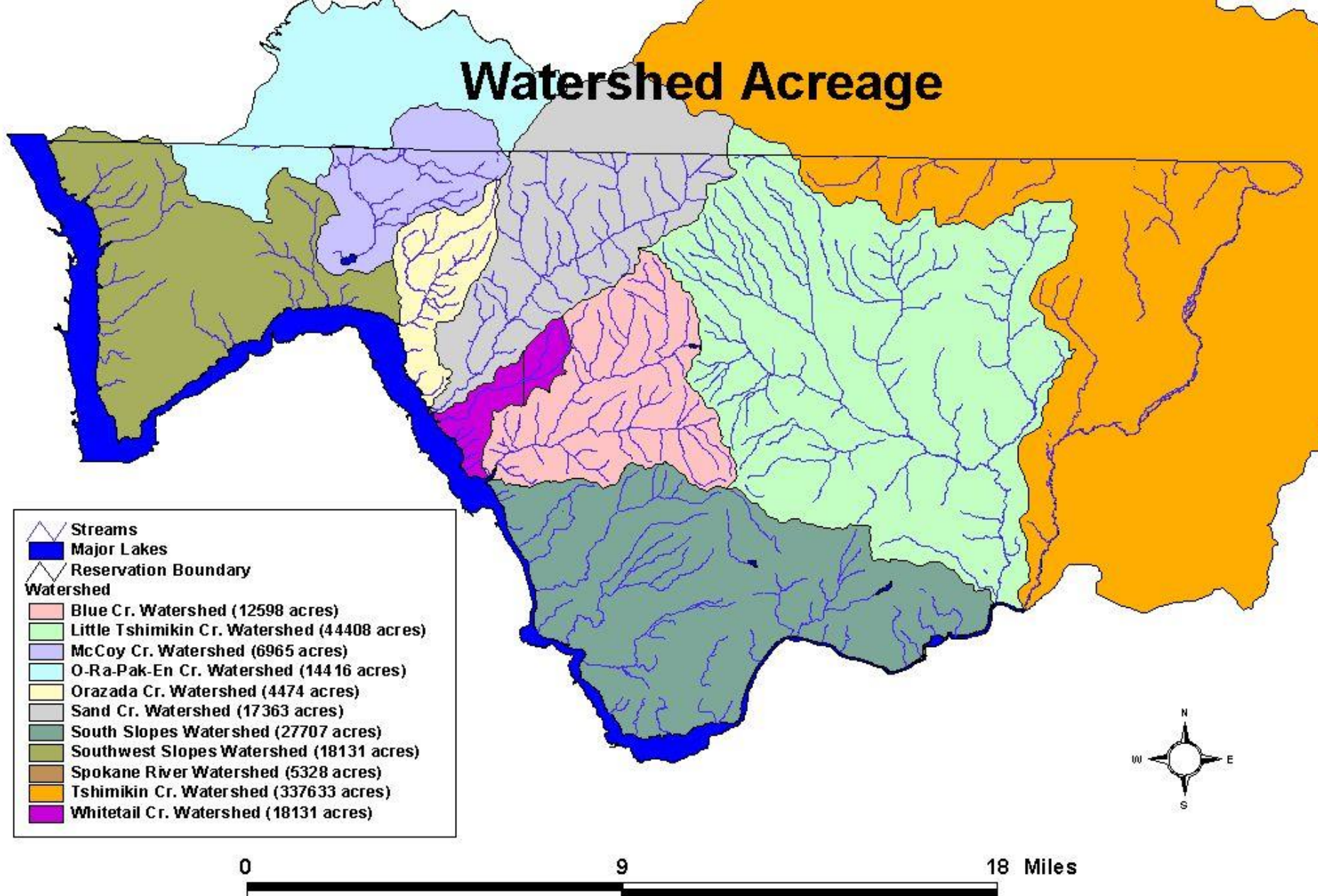
SPOKANE TRIBE WATER & FISH PROGRAM MANAGER



Spokane Indian Reservation



Watershed Acreage



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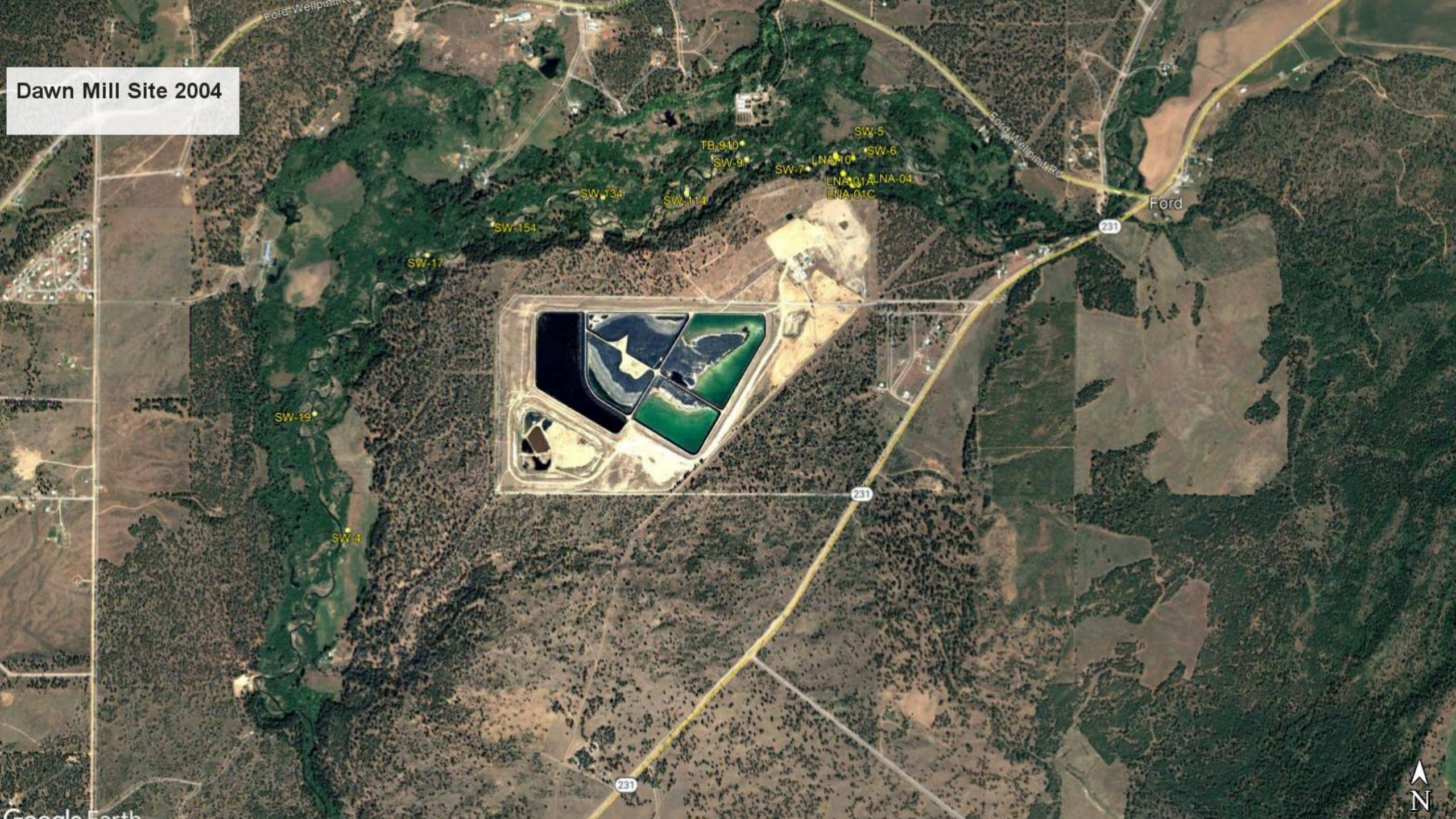
Dawn Mill Site 1995



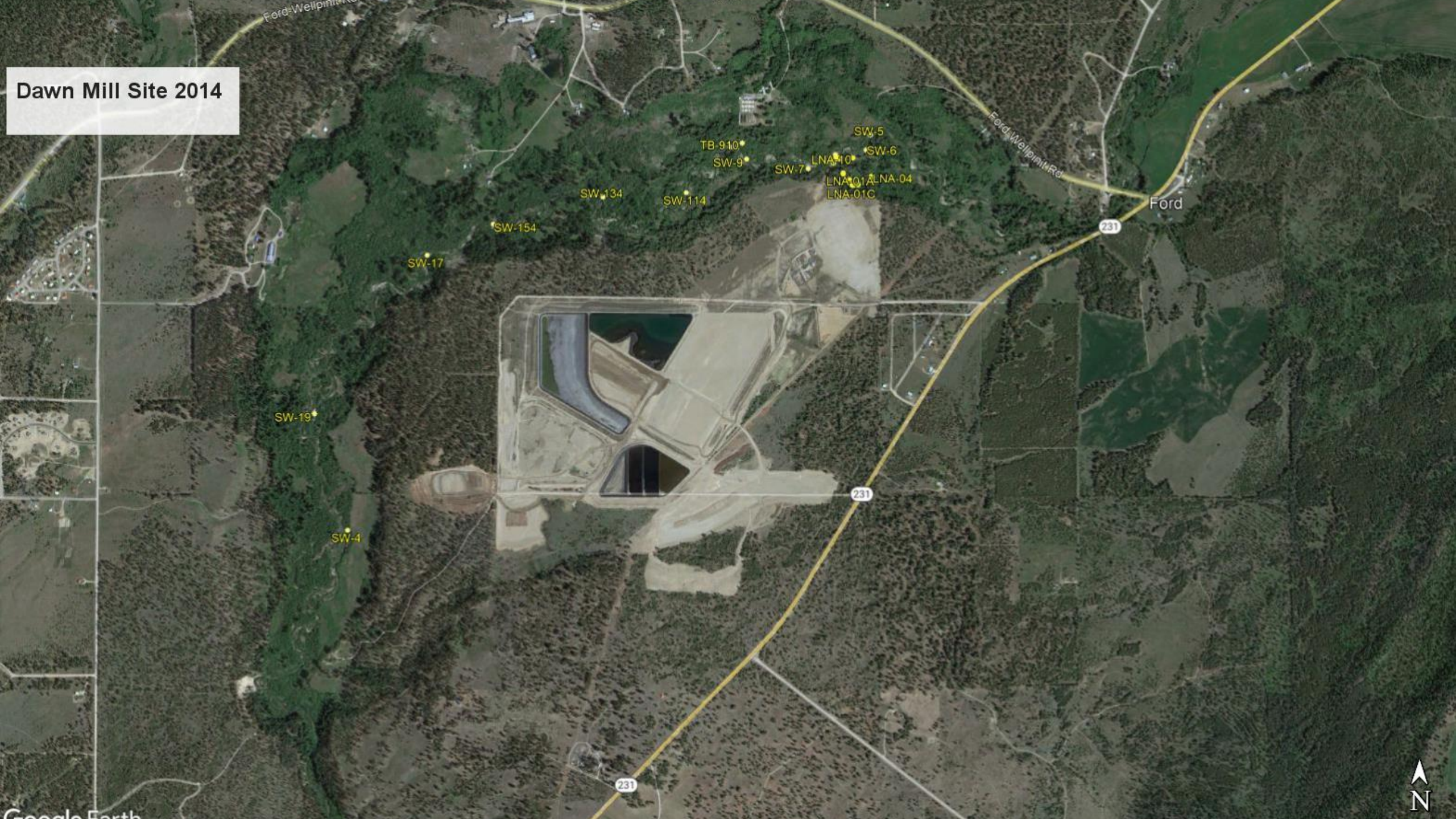
Dawn Mining Company (DMC)

- ▶ Operated 1956 to early 1980's
- ▶ Processed 58 million cubic ft uranium ore mostly from Midnite Mine (DMC)
- ▶ NRC delegated authority 1969 to Washington Dept. of Health, Waste Mgmt. Section
- ▶ 1981 1st lined disposal area approved TDA-4
- ▶ 1982 milling ceased, 1987 closure and reclamation plan
- ▶ 1989 groundwater contamination detected along Chamokane Creek (WSA)
- ▶ 1992 asked to place off-site uranium mill tailings in TDA-4, 1994 WDOH agrees with stipulation ground water remediation occur (WSA)

Dawn Mill Site 2004



Dawn Mill Site 2014



DMC cont.

- ▶ 2001 WDOH amended license to allow filtercake from Midnite in TDA-4, stop pumping water from wells along Chamokane because concentrations were not dropping; explored bio-remediation
- ▶ 2008 bio-remediation unsuccessful and ceased
- ▶ 2009 DMC discovered groundwater contamination below ore stock pile area and installed more monitoring wells (Lower North Area)
- ▶ 2010 covered TDA-4 end of waste accumulation
- ▶ 2013 Constructed new evaporation pond (EP6)



DMC MILL SITE

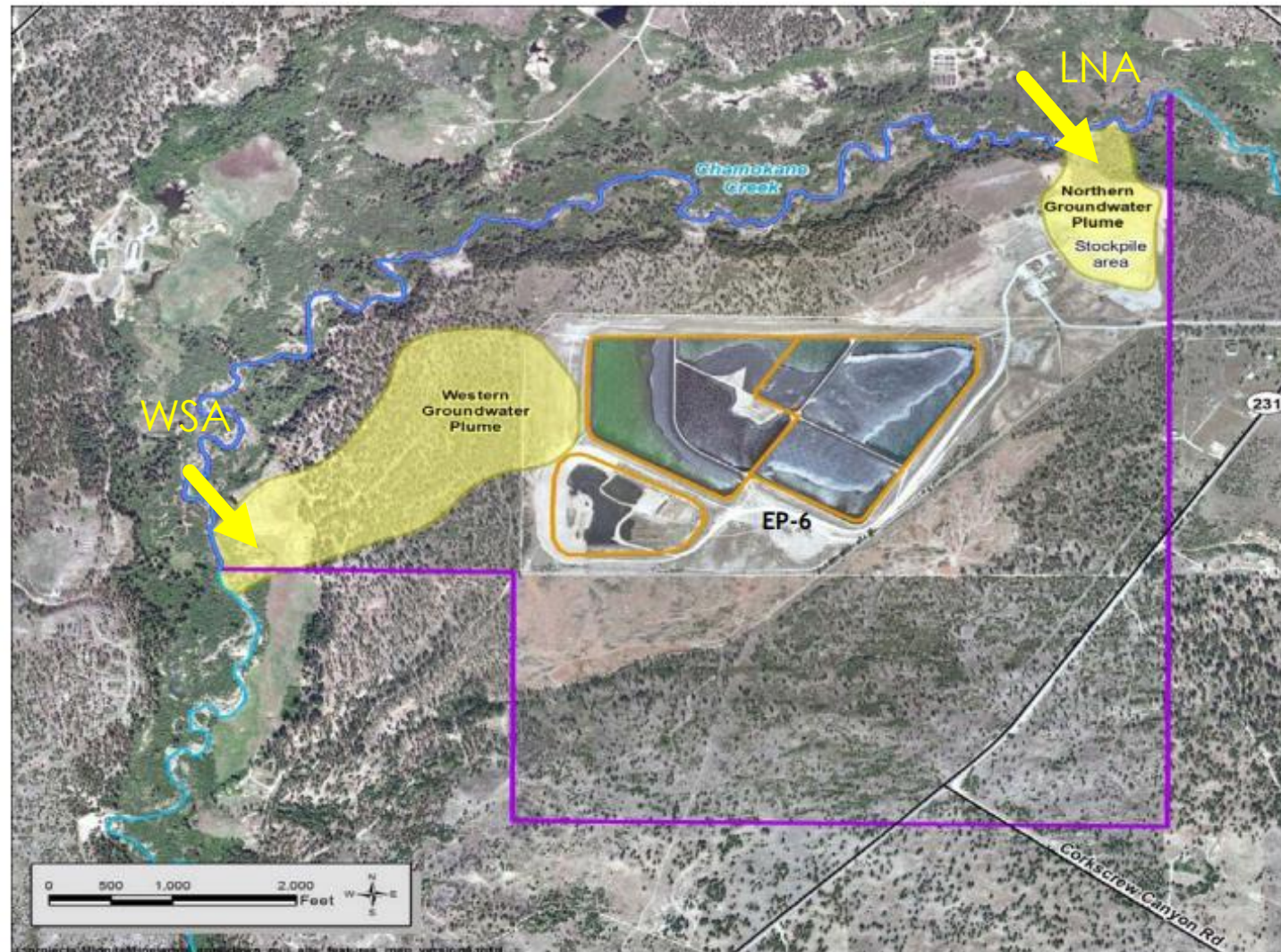
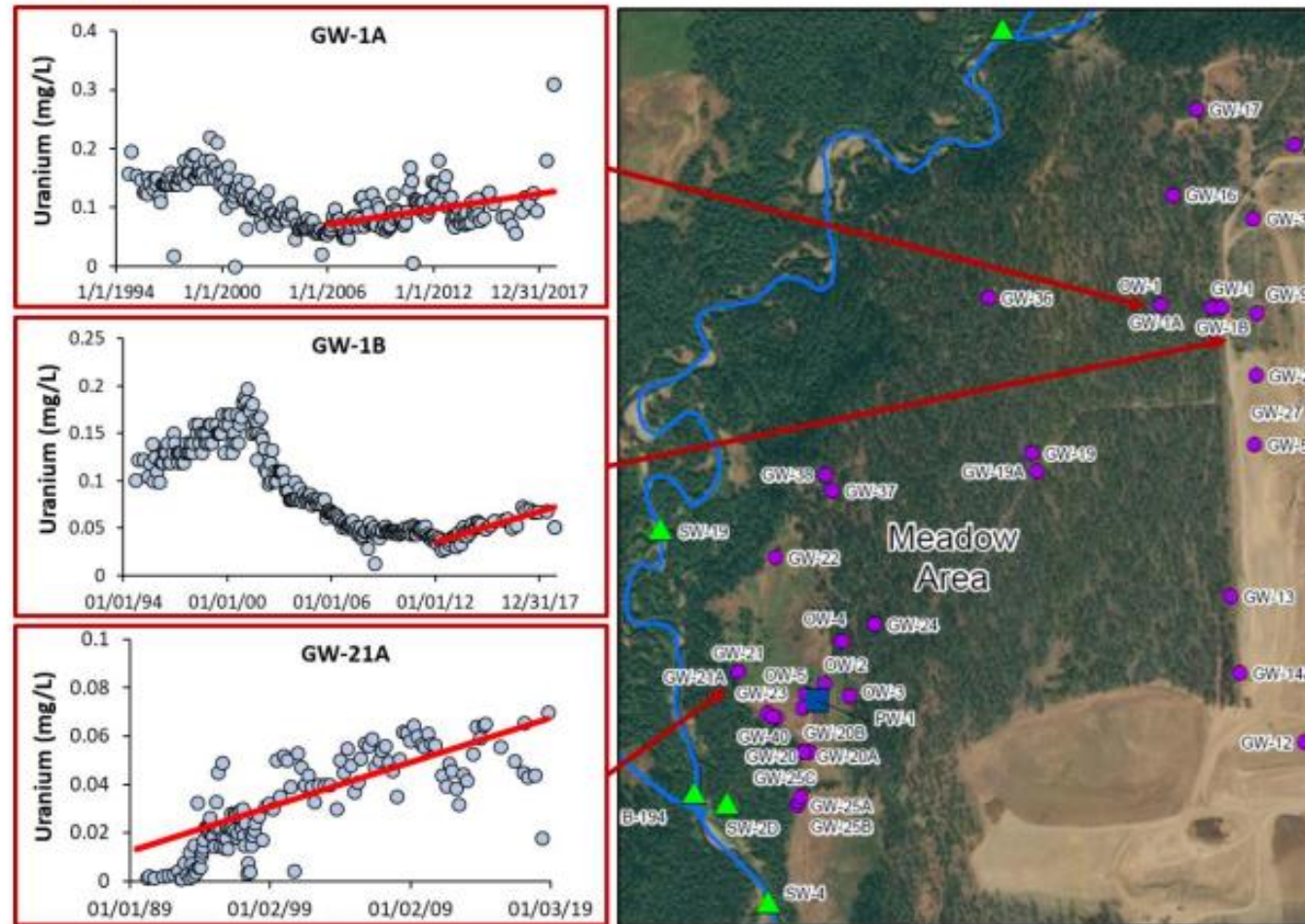


Figure 4. Site data show that concentrations of uranium are increasing in multiple wells in the western plume.



Source: ACL Application, Appendix A, Figure 3-9.

Figure 3. Site data show that concentrations of uranium are increasing in multiple wells (LNA-08, XOSA-5, and XOSA-18) in the northern plume area. In addition, concentrations at several upgradient wells (located toward the center of the plume) have remained constant over the past decade (e.g., XOSA-21, XOSA-23, XOSA-25), contrary to modeled results presented in the ACL that show declining trends.

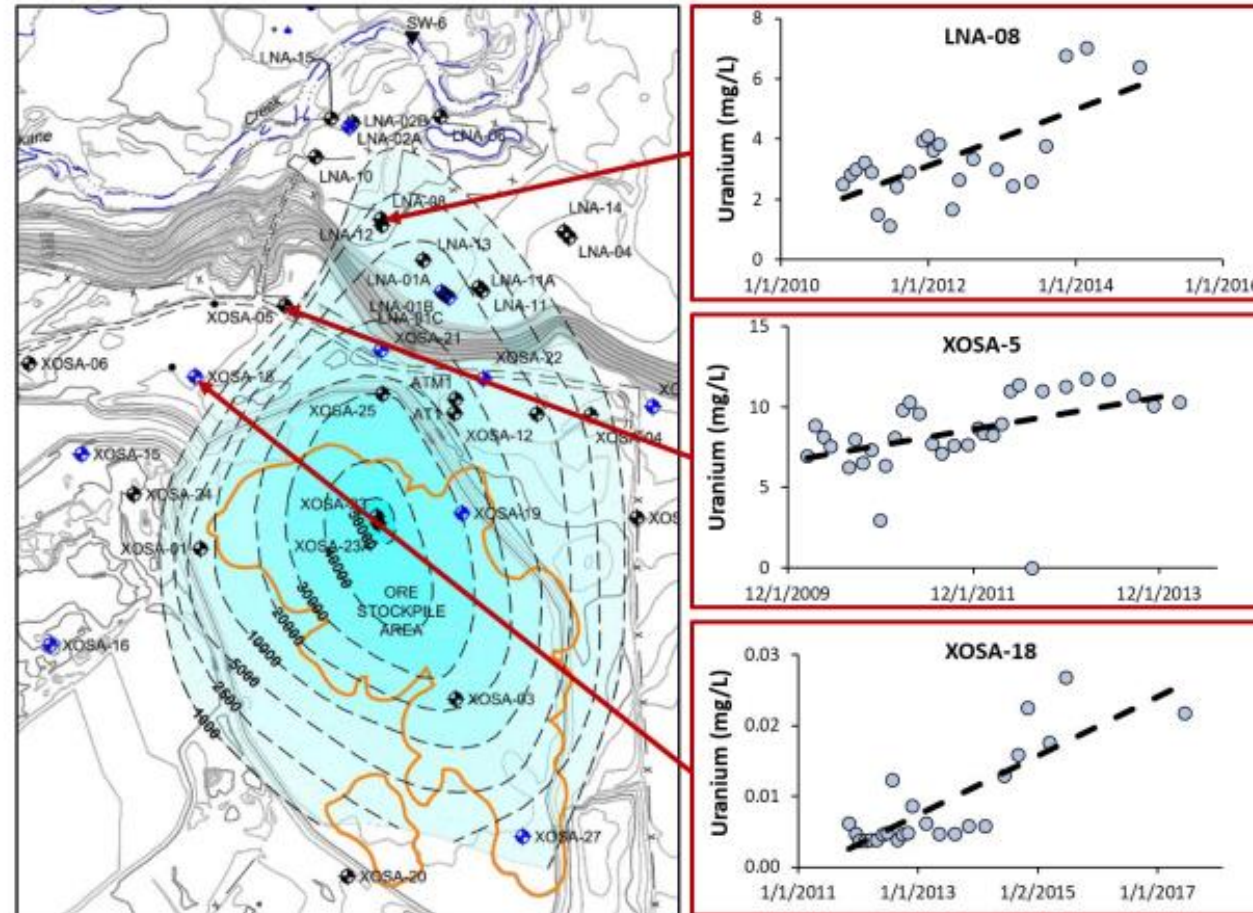


Figure 3. Model output for well LNA-08 (blue line) compared to measured samples (maroon squares). Black arrows have been added to show that the measured increases in uranium concentrations between 2008 and 2016 follow a similar trend predicted by the model ~ 15 years earlier. The original figure is from Figure 5-8 in Appendix A of the ACL Application.

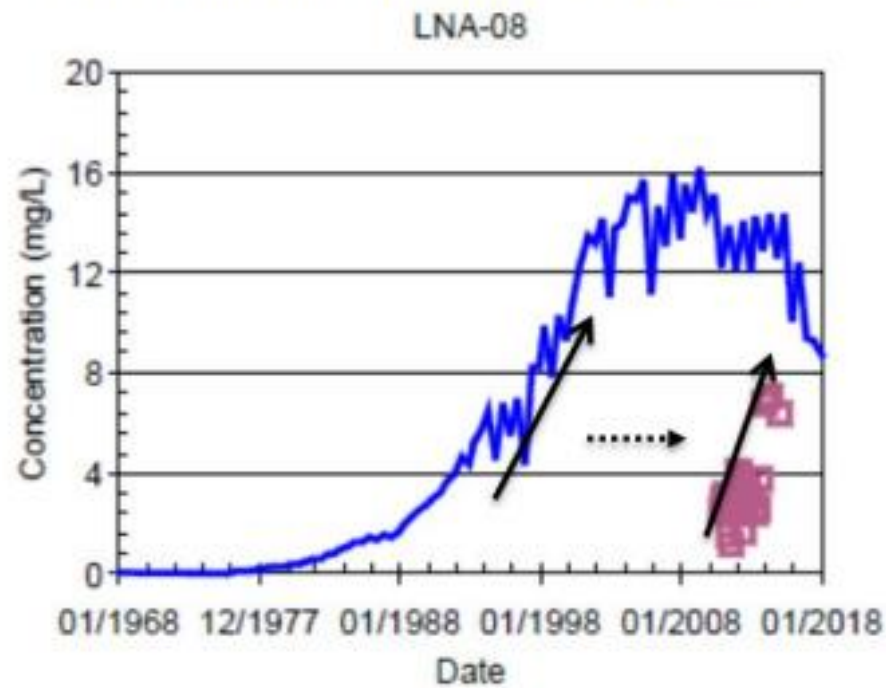


Figure 4. Uranium concentrations in the Scour Hole collected by STI in April 2018. Uranium concentrations on the west side of the Scour Hole are as much as three orders of magnitude higher than the average values DMC presented with their proposed POE locations (SH1 and SH5: 15 $\mu\text{g/L}$).

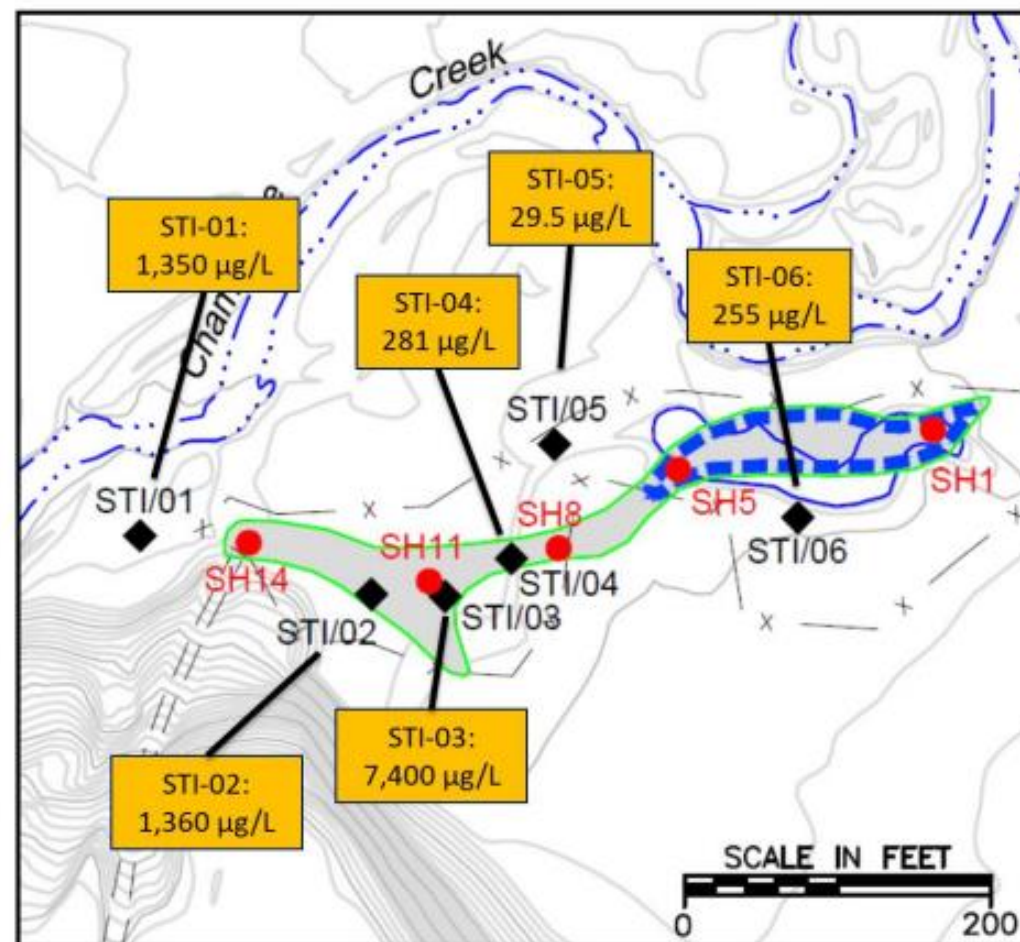
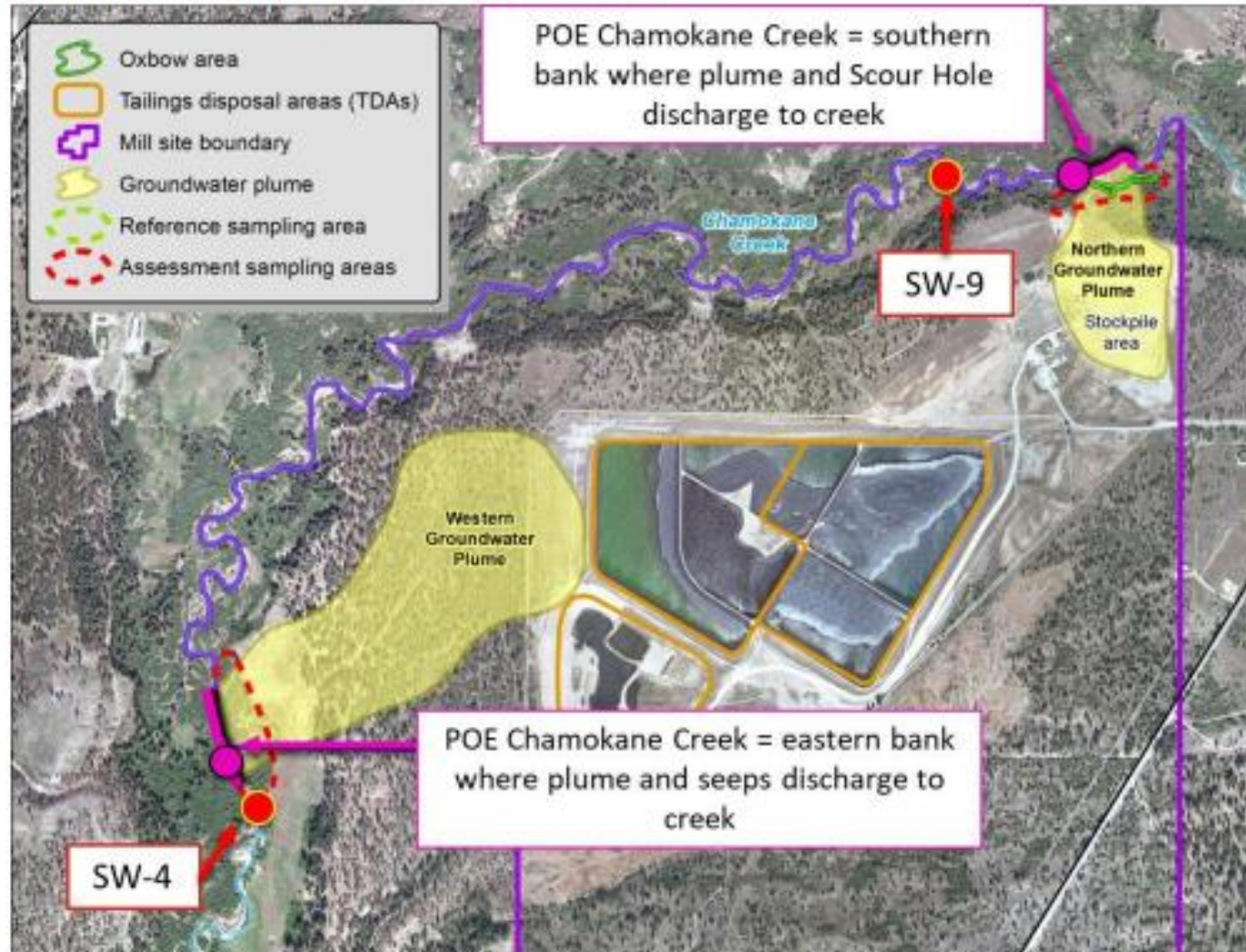


Figure 5. Chamokane Creek POEs proposed by the STI (pink) compared to the Chamokane Creek POEs proposed by DMC (SW-9, SW-4, in red).



Alternative Concentration Limits (ACL)

- ▶ 2015 WDOH agrees to let DMC apply for ACLs
- ▶ Point of Compliance (POC)
- ▶ Point of Exposure (POE)
- ▶ NRC guidance “the licensee cannot rely on natural flushing beyond the POE to either attenuate contamination or delay the implementation of corrective action programs”
- ▶ Increasing concentrations, intentional site selection, human and ecological health risk assessment deficiencies

Benefits Analysis

Table 3. Input parameter values to produce avoidance of adverse health impacts compared to costs of the corrective action alternative

Input parameter	Input values used in DMC's analysis	Input values used by STI with maximum uranium concentrations at SW-9 POE	STI values (maximum POE at the bank)
Critical group	94 people	2,094 people	2,094 people
Value of averted dose	\$2,000 (in 2004\$)	\$6,246 (in 2018\$)	\$6,246 (in 2018\$)
Incremental uranium concentration in Chamokane Creek (i.e., concentration above background)	3 pCi/L	21.4 pCi/L	193 pCi/L
Analysis period	1,000 years	Unchanged	Unchanged
Uranium concentration trend with time	Concentrations decrease over time	Retained this assumption	Retained this assumption
Population growth rate	1.7%	Unchanged	Unchanged
Collective averted dose (Modern and Traditional Subsistence receptors)	Modern: 0.67 Traditional: 2.74	Modern: 326 Traditional: 1,308	Modern: 3,281 Traditional: 13,157
Present-value benefits (Modern and Traditional Subsistence receptors)	Modern: \$1,400 Traditional: \$5,500 (in 2004\$)	Modern: \$2,106,800 Traditional: \$8,179,400 (in 2018\$)	Modern: \$21,231,000 Traditional: \$82,265,200 (in 2018\$)
DMC's estimated cost of feasible corrective action Alternative O2, source containment	\$4,100,000 (in 2018\$)		

Present values rounded to nearest hundred dollar.

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