

**Crawford Creek and Tributary
GLLA Project
May 26, 2021 Project Meeting**

Opening Remarks – Scott Cieniawski, EPA

Agenda

- 1. Safety Moment**
 - 2. Meeting Objectives**
 - 3. Recent Activities**
 - 4. Key Decision Points To Be Resolved**
 - 5. Path Forward and Schedule**
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Safety Moment

- Regularly check on friends and relatives that live alone.
- Prepare for and protect against spring ticks, mosquitos, and biologicals.

Meeting Objectives

- Update WDNR on recent FFS-related activities.
- Identify and discuss several key decision points that require resolution.
- Set the stage to identify any WDNR information needs that will lead to concurrence on key decision points before preparing the FFS document.
- Establish a plan and schedule for proceeding with the FFS.

Recent Activities

- Provided draft Data Gap Investigation Summary Report to WDNR on April 23, 2021. (If WDNR has any comments, please send via email)
- Provided DGI sample data to property owners (Kolanczyk, County, Reuille, Laurvick).
- Discussions with property owners regarding DGI results and interviews regarding floodplain usage.
- Further evaluated WDNR proposed CULs, and their application, in light of property owner discussions.
- Continued to evaluate waste disposal options to extent possible at this stage. Expect to discuss further on future call after CULs are finalized.

Key Decision Points To Be Resolved

- Exposure Weighted Averaging
- Updated Site-Specific Recreational CULs

EXPOSURE WEIGHTED AVERAGING

Exposure Weighted Averaging

- Risk-based approaches assume people visit the entire exposure area, not one point.
 - Using point-by-point comparisons leads to the unrealistic assumption of a receptor going to only a single location in the exposure area, for the entire exposure duration.
- NR 720.07(2)b allows averaging with prior WDNR concurrence.
- Consider application of both depth and surface weighted averaging for comparison of sample data to CULs.

Depth Weighted Averaging

- Concentration data available for multiple depth intervals.
 - For a receptor to contact deeper floodplain materials, must dig through shallower intervals and would be exposed to materials over the entire depth encountered.
 - Leads to being exposed to the depth-weighted average concentration.
 - EPA guidance supports depth-weighted averaging (USEPA 1996)
 - *“If each subsurface soil core segment represents the same subsurface soil interval then the average concentration from the surface to the depth of contamination is the simple arithmetic average of contaminant concentrations...”*
- **Use of depth-weighted averaging of sample data for comparison to CULs better reflects exposures throughout the sample depth interval**

Surface Weighted Averaging

- WDNR's June 2020 CUL Memo references other sites where surface weighted average concentrations (SWACs) were utilized.
 - EPA guidance supports averaging across an exposure area (USEPA 1992)
 - *"...toxicity criteria are based on lifetime average exposures."*
 - *"Average concentration is most representative of the concentration that would be contacted at a site, over time. An individual is assumed to move randomly across an exposure area (EA) over time, spending equivalent amounts of time in each location."*
 - 95 UCL used to account for uncertainty about the arithmetic average.
- **Use of surface-weighted averaging (95 UCL) of sample data for comparison to CULs better reflects long-term exposure**

UPDATED SITE-SPECIFIC RECREATIONAL CULs

Review of WDNR-Proposed Recreational CULs

- WDNR June 2020 CUL Memo presents derivation of proposed recreational exposure CULs.
- WDNR CUL memo recognizes existence of conditions that affect exposure and modifies default non-industrial exposure assumptions:

	WDNR Recreational Exposure Scenario	WDNR Non-Industrial Exposure Scenario
Age Range (Child) (years)	2-6	0-6
Exposure Frequency (days)	175 ¹	350
Exposure Time (hours)	4 ²	24

1. 175 days = recreational access to affected Site occurs 5 times per week for 35 weeks excluding the winter months with frozen ground conditions, or that snow-covered ground is preventing exposure to Site soils during winter months.
2. Exposure time (ET) = 4 hours per event based on typical time spent outdoors per USEPA's Exposure Factor Handbook (2011).

- Per WDNR CUL memo, property owners must consent to application of recreational use exposure scenario. To date, these discussion have not taken place.

Property Owner Interviews

- Interviewed Kolanczyk, Douglas County, Reuille and Laurvick during discussions regarding DGI sample data.
- Asked questions related to past, present and future time spent in floodplain: activities, frequency, duration, etc.
- Key takeaways from interviews:
 - Children younger than 2 years old do not visit floodplain (consistent with WDNR assumption); 2- to 6-year old children rarely visit the floodplain.
 - Most common use is for hunting, but primarily in tree stands.
 - Floodplain visits are limited during summer months due to heat, mosquitoes, ticks.
 - Frequency of visits varies from rarely to several days a week during portions of the year.
 - Length of visits is typically 1 hour.
 - Residents do not contact floodplain materials (i.e., no digging, etc.).

Further, Site-Specific Refinements to Recreational CULs

- Team proposes to further refine the WDNR recreator CULs using additional site-specific information
 - Use of Fraction Intake (FI) term
 - Adjust exposure assumptions based on results of property owner interviews:
 - Exposure Frequency (EF)
 - Exposure Time (ET)

FRACTION INTAKE

Fraction Intake - Overview

- Definition: A term to account for the fraction of soil contacted that is presumed to be contaminated (USEPA 2003, USEPA 1989).
- Accounts for the fact that people may not spend their entire time in floodplain while outside, which is particularly true if the area is distant from homes, as is the case with the floodplain.
- FI not explicitly included in WDNR recreator CULs; but effectively assumed to be 1.0
- Without the FI term, CULs assume all outdoor dermal and ingestion exposure comes from floodplain.
- FI can be added to dermal/ingestion CUL equations to reflect that a receptor is in floodplain only a portion of the time.
- WDNR Recreator CULs assume 4 hours outdoors (ET), but ET is only included in inhalation pathway. Should apply to all exposure pathways (dermal and ingestion).

Fraction Intake – Estimate based on Fraction of Property

- One way to estimate an FI is to determine the fraction of property comprised of the floodplain
 - Floodplain represents only a fraction of entire property
 - FI accounts for property owners spending only a fraction of outdoor time in the floodplain

Owner	Total Acreage (# parcels)	Floodplain Acreage	Fraction of Total Property Acreage Comprised by Floodplain
Kolanczyk	48.15 (3)	12.57	0.26
Reuille	100.98 (3)	8.64	0.09
Laurvick	99.68 (6)	20.91	0.21

- Highest fraction is approximately 0.25
- An FI of 0.25 is conservative given property owners spend more time closer to houses than in the floodplain

Fraction Intake – Estimate based on Exposure Time from Interviews

- Another way to estimate an FI is based on the amount of time a receptor spends in the floodplain relative to the total amount of time spent outdoors.
 - Property owner interviews indicate most people spend about one hour or less in the floodplain.
 - Responses suggest hunters are spending most of their time in tree stands.
 - Go on floodplain during travel to/from tree stand and/or to retrieve deer they have shot.
 - Given seasonal bag limits, limited number of game retrievals from the floodplain.
 - 1 hour in floodplain / 4 total hours spent outside = FI of 0.25.
 - Both estimation methods result in an FI of 0.25.
- **Use of FI=0.25 better accounts for site-specific dermal/ingestion exposures**

EXPOSURE FREQUENCY (EF)

Exposure Frequency (days/year)

- WDNR Non-Industrial EF = 350 days
- WDNR Recreator CUL EF = 175 days
- Interview results indicate shorter EF is more representative and appropriate.

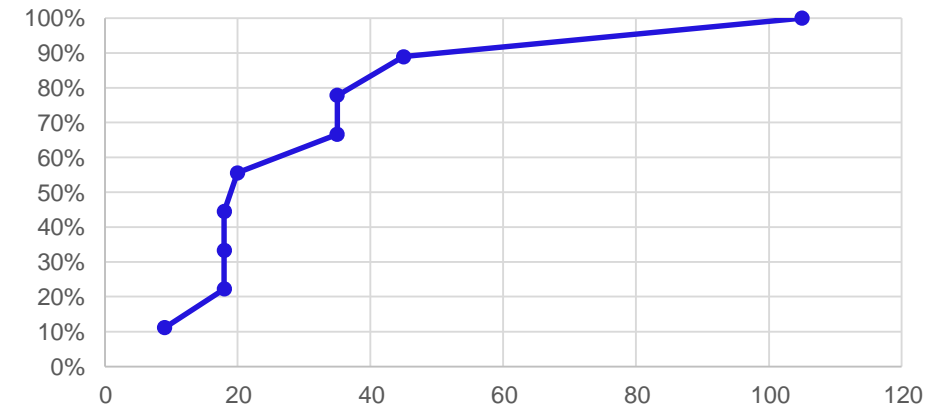
Exposure Frequency Summary from Survey			
Person	Estimated Days	Estimated Days Rationale	Survey-specific Notes
Mrs. Laurvick	105	3 days per week for 35 non-frozen weeks (see note)	"several days a week...sometimes every day...less in the summer"; Mrs. Laurvick walks dog (more in winter than other seasons due to ticks/mosquitoes)
Mr. Laurvick	45	Two days per week for 10 weeks of exposure to non-frozen/non-snow-covered (see note) during hunting season (September - December); once per week for remaining 25 non-frozen weeks.	rides ATV and hunts, maintains trails with Bobcat
Laurvick Grandson	20	Two times per week for 10 non-frozen weeks during the hunting season (see note)	grandson hunts deer (September through December)
Laurvick Neighbors	18	Once every other week for 35 non-frozen weeks (see note) (35 days ÷ 2 = 17.5 days, rounded to 18 days)	Neighbors use trails on property for walking, snowshoeing, snowmobiling, and wood cutting - all seasons (but more in winter)
Laurvick friend cuts wood	9	Once per month during non-frozen months (March - November)	Friend cuts wood periodically
Mr. Kolanczyk	35	Every other day during 10 non-frozen weeks of hunting season (see note)	hunt partridge, deer, and bear - mostly at outer edges of floodplain (September through December). As much as every other day during hunting seasons (September through December)
Trespassers	18	Once every other week for 35 non-frozen weeks (see note)	occasional trespassers
Mr. Reuille	35	Once per week for 35 non-frozen weeks (see note)	Once per week typical (sometimes more/less)
Reuille Neighbors	18	Once every other week for 35 non-frozen weeks (see note) (35 days ÷ 2 = 17.5 days, rounded to 18 days)	every other week typical (sometimes more/less)

Note: Soils are assumed to be inaccessible for the following weeks due to temperature/snow: November 2 weeks, December 4 weeks, January 4 weeks, February 4 weeks, March 3 weeks. The following are non-frozen weeks during the hunting season: September 4 weeks, October 4 weeks, November 2 weeks.

Exposure Frequency (days/year)

- Interview results support an EF of 75 days
- Still conservative for a remote floodplain setting – equates to 2+ days per week during 35 non-frozen weeks
- For comparison, dredged material placement criteria for Howard’s Bay GLLA Project (as landfill cover with a future use as a park with trails/benches/shelters) were derived using an EF of 90 days (3 days per week for 30 non-frozen weeks)
- **75 days is a conservative upper bound Exposure Frequency assumption for adults (6-26) and especially for children (2-6)**

Exposure Frequency Probability



Exposure Frequency Percentiles	Days
50th percentile	28
90th percentile	45
95th percentile	75
99th percentile	105



EXPOSURE TIME (ET)

Exposure Time (hours per visit)

- WDNR Non-Industrial CUL ET = 24 hours inside and outdoors.
 - WDNR Recreator CUL ET = 4 hours outdoors.
 - Interview results support an ET of 1 hour per visit specific to the floodplain. People do not spend their entire time while outside in floodplain.
- **ET = 1 hour/visit is a reasonable but still conservative Exposure Time assumption**

SUMMARY OF PROPOSED EXPOSURE ASSUMPTION REFINEMENTS AND UPDATED CULs

Summary of Proposed Site-Specific Recreational Exposure Assumption Refinements

Input Parameter	WDNR Recreational Exposure Scenario	Proposed Parameter Refinements
Fraction Intake (for dermal/ingestion)	1.0 (effectively)	0.25
Exposure Frequency (days)	175	75
Exposure Time (hours, for inhalation)	4	1
Age Range (years)	2-6 child 6-26 adult	No change
Adherence Factor (mg/cm ²)	0.2 child 0.07 adult	No change
Body Weight (kg)	15 child 80 adult	No change
Exposure Duration (years)	4 child 20 adult	No change
Soil Ingestion Rate (mg/day)	200 child 100 adult	No change
Skin Surface Area (cm ² /day)	2,373 child 6,032 adult	No change

Updated Site-Specific Recreational Exposure CULs

- FI = 0.25 (dermal and ingestion only)
- ~4X increase in CULs

	Excess Lifetime Cancer Risk Target	WDNR Recreational Exposure CUL	Updated Recreational Exposure CUL
TCDD (ppt)	1E-6	13.1	52.4
BaP (ppm)	1E-5	5.09	20.4

- FI = 0.25 (dermal and ingestion only)
- Exposure Frequency (75 days)
- Exposure Time (1 hour)
- ~9X increase in CULs

	Excess Lifetime Cancer Risk Target	WDNR Recreational Exposure CUL	Updated Recreational Exposure CUL
TCDD (ppt)	1E-6	13.1	123
BaP (ppm)	1E-5	5.09	47.5

- For comparison, USEPA's residential non-cancer RSL for TCDD is 51 ppt

Summary of Site-Specific Recreational Exposure CULs

	Excess Lifetime Cancer Risk Target	WDNR Recreational Exposure CUL	Updated Recreational Exposure CUL (FI=0.25)	Updated Recreational Exposure CUL (EF=75, ET-1, FI=0.25)
TCDD (ppt)	1E-6	13.1	52.4	123
BaP (ppm)	1E-5	5.09	20.4	47.5

- **Use of updated, site-specific recreational exposure CULs is technically justifiable and protective.**
 - Uses site-specific information obtained from property owner interviews.
 - Easier to support/justify during public meetings and property owner discussions than use of CUL multiples.

Path Forward and Schedule



Path Forward and Requests for WDNR

- Provide any comments on the Data Gap Investigation Summary Report.
- Review information from this call and provide feedback with any information requests in next 2 weeks.
- Propose next call on June 9 to finalize CULs and data application approach (i.e., depth and surface weighted averaging). Time preference?

Proposed FFS Schedule

- June 9: Call to reach consensus on CULs and data usage (weighted averaging) approach.
- Mid-June : Return to preparing the Draft FFS document (Sections 1-11) and continue developing list of alternatives for FFS evaluation.
- September: Submit Draft FFS to WDNR including Description of Remedial Alternatives and Evaluation Criteria (Excluding Section 12 Detailed Evaluation of Alternatives).
- End of September:
Meeting with WDNR to discuss Preliminary Remedial Alternatives and Evaluation Criteria. Obtain WDNR input for conducting detailed evaluation of alternatives.
- November: Finalize Draft FFS Report, including Alternatives Evaluation, and schedule meeting with WDNR for final review. Establish schedule for public meeting and finalizing FFS.

Any WDNR questions or information requests for Beazer/EPA at this time?