Savannah River
NUCLEAR SOLUTIONS℠
FLUOR • NEWPORT NEWS NUCLEAR • HONEYWELL

Scoping Summary for the Steel Creek Integrator Operable Unit

SEMS Number: 71

ERD-EN-2001-0181

FINAL

September 2018

DISCLAIMER

Printed in the United States of America

Prepared for
U.S. Department of Energy
And
Savannah River Nuclear Solutions, LLC
Aiken, South Carolina

TABLE OF CONTENTS

1.0 PROJECT PHASE AND STATUS OF THE STEEL CREEK INTEGRATOR OPERABLE UNIT

This Scoping Summary reflects the status of development of the Steel Creek (SC) Integrator Operable Unit (IOU) Periodic Report 6 (PR6).

The objectives of this scoping summary, and status, include:

- update the SC IOU conceptual site model (CSM) based on information and data obtained since submittal of SC PR5; SC PR6 data indicated elevated levels of DDT (and metabolites) and mercury associated with the Dunbarton Rail Road Yard (DRRY) that may impact the upper portion of Meyers Branch.
- identify any new data needs arising from the evaluation of data for PR6; no data needs were identified based on review of SC PR6 data.
- evaluate the need for early actions based on the revised CSM and new data indicated above; there are no early actions proposed based on review of SC PR6 data.

This Scoping Summary also documents changes to the IOU program as Phase II (long-term assessment and reporting) continues. The benchmarks for SC PR6 for screening potential HH and ecological contaminant threats were updated following the approach used in the Remedial Investigation Workplan/Baseline Risk Assessment (RI/BRA) for the Lower Three Runs (LTR) IOU (SRNS-RP-2017-00139, Revision 1, December 2017). The IOU benchmarks have been updated using the most current thresholds. The benchmark screening is primarily used to assist in problem formulation and refinement of the risk assessment process as Phase II continues over the next several decades.

For HH, sediment data are screened against benchmarks for the onsite worker (OSW) at $1x10^{-4}$ risk level or HQ > 3. The $1x10^{-4}$ risk level (or HQ > 3) level is used for Phase II as an early action determination threshold. Fish data are also screened against a $1x10^{-4}$ risk level or HQ > 3 for a subsistence fisherman scenario. The subsistence fisherman is not a likely scenario; however, this scenario has applicability for Phase III assessment and is currently the standard scenario for all the IOUs. The revised HH screening for surface water (SW) is based on maximum contaminant levels (MCLs). Although SW on the SRS is not used as a drinking water source, the MCL screening assists in problem formulation as the IOU program continues to align to Phase III remedial goals.

The revised ecological screening thresholds (benchmarks) are based on a single benchmark for each analyte/medium. The sediment benchmarks are based on Refinement Screening Values (RSVs) (derived from USEPA Region 4 Ecological Risk Assessment Supplement Guidance, USEPA 2018) to focus the evaluation on constituents that may require further scrutiny. The surface water benchmarks are based on the South Carolina Department of Health and Environmental Control (SCDHEC), R.61-68, Water Classifications and Standards (SCDHEC 2014) or USEPA Region 4 Ecological Risk Assessment Supplement Guidance chronic values. The RESidual RADioactive (RESRAD) screening values, developed by Argonne National Laboratory, are used for detected radionuclides. The RESRAD Tier 3 values were generated by Savannah River National Laboratory and are based on exposure for aquatic animals.

Although contaminant screening is useful in identifying potential contaminant threats to ecological receptors, biological data are used to assess the ecological health of the IOU. The biological data used for periodic bioassessment monitoring generally consists of fish assemblage surveys, fish tissue body burden data, macroinvertebrate surveys, and habitat assessments. It is proposed these surveys, as appropriate, be conducted on an approximate ten-year basis to assess the status and trends of stream health during Phase II assessment. Additional surveys/data collection efforts can be pursued if conditions warrant.

To better assess the bioavailability of contaminants, the IOU is beginning to transition to passive sampling techniques (such as diffusive gradients in thin films [DGT]) for monitoring contaminants of interest. The passive samplers use semi-permeable membranes that mimic biological membranes to better assess contaminants that pose an ecological threat. The intent is to supplement the passive samplers with past and active fish tissue collections, with the goal of primarily using the passive samplers for long-term IOU monitoring. As the IOU approaches Phase III final action determination, the applicability of the DGT data for final action determinations will be revisited.

The SC PR6 Revision 0 document is due September 30, 2018. The sixth Phase II Field Start for the SC IOU (Including Wetland Area at Dunbarton Bay [NBN], L Lake [NBN], and L-Reactor Discharge Canal [NBN]) is July 30, 2019. The remedial action start date for the Wetland Area at Dunbarton Bay (NBN) in Support of SC IOU is February 19, 2019. The current projected field start for Phase III is February 2059 with a Record of Decision (ROD) issuance date of August 2064.

The status of data needs identified in PR5 associated with monitoring the long-term health of the IOU is provided below.

- PR 5 identified collection of crayfish data from L Lake and Lower SC for various metals.PR 5 identified a need for aluminum, antimony, barium, and beryllium data for fish for Upper SC due to lack of data in a previous trophic modeling effort. This **data collection effort is being deferred** for a future PR to support final action determination appropriate for Phase III assessment.
- PR 5 identified a data need for cyanide, silver, and thallium in sediment/soil medium for Lower SC, and sediment if available. This **data need has been met** by the collection of sediment and SW for intended metals/inorganics.
- PR 5 identified a data need associated with DRRY (Unit 546). The unit is located upgradient (near the headwaters) of Meyers Branch. This **data need has been met** with a walk down of the DRRY outfall locations and collection of sediment and SW samples at locations that may eventually discharge to the SC IOU (Meyers Branch).

- PR 5 identified collection of background data from Meyers Branch from the main side channel to assist in background determination for sediment/soil, sediment, and fish. This **data need has been met** with the collection of background data from Meyers Branch.

For ongoing Phase II assessment/monitoring the following data needs were identified:

- Periodic assessment of the fish and macroinvertebrate assemblages to support the long-term ecological assessment of the SC IOU as Phase II continues. This **data need will be met** with a compiled bioassessment report that will status the current understanding of the health of the SC IOU based on various bioassessment indices implemented for SC. This report continues the site-wide IOU assessment to monitor conditions within SC based on ecological indices and will be reported in a future PR.

- Periodic review of future research efforts conducted on or off the SRS relating to contaminants or receptors applicable to the SC IOU as part of the literature-based wildlife survey (WLS). This **data need has been met** and will be reported in SC PR6.

2.0 BACKGROUND

SC is located in the southeastern portion of the SRS between the Pen Branch and LTR watersheds and flows southwesterly for approximately 17.5 km (10.6 mi) before entering the Savannah River via the Savannah River swamp. The SC stream system includes L Lake, a cooling water reservoir that is approximately 6.5 km (4 mi) long and relatively narrow, encompassing an area of about 418 ha (1,034 acres). Flow from the L Lake dam travels about 5 km (3 mi) before entering the Savannah River swamp and then another 3 km (1.8 mi) before entering the Savannah River. Meyers Branch is the main tributary of SC and flows approximately 10 km (6.2 mi) before entering SC below L Lake. Meyers Branch is a small blackwater stream that has remained relatively undisturbed by SRS operations. The total area drained by the SC-Meyers Branch system is about 91 km^2 (35 mi^2).

The SC IOU is defined as SC, its tributaries (Meyers Branch is the main tributary of SC), and L Lake including SW, sediment, sediment/soil, and related biota in these streams and their associated floodplains (Figure 1). The SC IOU includes L-Lake, L-Area Reactor Discharge Canal, P-Area Reactor Discharge Canal, and the Wetland Area at Dunbarton Bay (WADB). This area represents the integration of potential contaminant exposure pathways to onsite human and ecological receptors from potential SRS contaminant sources. The WADB is being addressed as a separate subunit with pursuance of final action as documented in the Record of Decision Remedial Alternative Selection for the Wetland Area at Dunbarton Bay in Support of Steel Creek Integrator Operable Unit (SRNS-2013-00730, Rev. 1, April 2018)

3.0 LAND USE

Current land use in the SC watershed is mixed. Two industrial areas (L Area and P Area) are within the SC watershed. L Area (including L Reactor facilities) is located entirely within the SC watershed. Portions of P Area are located within the SC watershed and the LTR watershed. The headwaters of SC originate near P Area. These industrial areas cover approximately 1% of the SC watershed. The remainder of the watershed is comprised of a large reservoir (L Lake), forest/managed forest, mixed bottomland hardwood and cypress/tupelo swamp and floodplain habitat or pond/reservoir habitat and is not used for industrial purposes.

The habitats associated with the SC IOU continue beyond the SRS boundary between SC and LTR. The SRS-controlled section of the Savannah River swamp, from above Upper Three Runs (UTR) to below SC, is currently posted "No Hunting, No Fishing, and No Unauthorized Access" and patrolled by SRS as part of the SRS access control program. No residential or unrestricted use in any part of the IOU is planned or anticipated.

For data evaluation purposes, the SC IOU is divided into subunits that are based on sub-watersheds. The following subunits comprise the SC IOU: Upper SC, L Lake, Lower SC, and Meyers Branch.

3.1 Human Health and Ecological Screening

Human health and ecological screening is conducted by comparing constituent concentrations to pre-established benchmark values for sediment, soil, SW, and fish. In general, the human health benchmark values for Phase II evaluations are used to identify constituent concentrations that result in a cancer risk equal to or greater than 1×10^{-4} or a hazard quotient (HQ) equal to or greater than 3 to determine the need for early action for sediment, sediment/soil media and fish tissue. The SW HH benchmarks are MCLs.

For the purposes of identifying problems warranting early actions, the human health evaluation focuses on the following human health scenarios:

- on-site worker for sediment, sediment/soil,
- hypothetical resident for SW, and
- subsistence fisherman for the ingestion of fish

The purpose of the ecological evaluation is to provide an overall indicator of ecological health for the SC IOU. The biological data are supplemented with benchmark comparisons that are used as a screening step to identify constituents that may pose a threat to ecological receptors. Past assessments of fish and macroinvertebrates have been used to assess the health of the SC IOU. These evaluations were supplemented by the IOU trophic modeling effort as documented in SC PR5.

Data are compiled by IOU subunit and a frequency of exceedance and maximum hazard quotient (HQ, maximum detected value/benchmark) are determined. Also, a mean HQ (mean detected valued/benchmark) is calculated for each constituent and is used to determine if mean values are greater than the benchmark (i.e., mean HQ > 1.0).

Constituents with HH or ecological benchmark exceedances are evaluated further if all criteria below are met:

1. The mean HQ > benchmark.

2. The frequency of exceedance is greater than 5%.

3. The mean detected value > maximum background, or if background data are non-determinant.

These criteria are also used for the human health evaluation to determine if early action consideration may be warranted. For the ecological evaluation, the exceedances that fail the criteria, along with biological data, are used to determine if possible early actions may need to be considered. Early actions may include additional ecological data collection during Phase II of the IOU program (long-term monitoring and assessment) to further assess potential threats. Phase III will initiate the RI/BRA Assessment for the SC IOU.

4.0 FISH EXPOSURE MEDIUM AND ECOLOGICAL EVALUATION

This section provides an evaluation of fish data based on human health screening for the subsistence fisherman. There are currently 72 records in the SC PR6 database for fish all from the SC Meyers Branch subunit. This section also includes an assessment of biological data that supports the SC IOU ecological evaluation.

Human Health Evaluation

- For the PR6 subsistence fisherman evaluation, there was one benchmark exceedance for mercury (benchmark = 0.1473 mg/kg) in the Meyers Branch subunit out of three analyses with a mean of 0.0801 mg/kg.

The mean result of the three detected results, 0.0801 mg/kg, is less than the benchmark (mean ratio = 0.54); therefore, further evaluation is not warranted at this time. Also, Meyers Branch serves as a background location, and this location (side channel of Meyers Branch) is not influenced by SRS operational sources that would have provided contaminated discharges or a source of mercury. Mercury is elevated regionally due to atmospheric deposition. Although not a potential source to Meyers Branch, mercury is also elevated in the Savannah River because of upgradient Savannah River historic discharges. There is a SCDHEC issued fish advisory for mercury in the Savannah River.

Ecological Evaluation

Bioassessment data are being compiled for SC PR6 to status the ecological health of the IOUs on a site-wide basis based on biological indices. Past bioassessments have indicated no deleterious effects on the health of individual organisms. Fish and macroinvertebrate evaluations showed some impairment in Upper SC which is an eroded system with deeply cut banks and is isolated from typical stream habitats by L Lake. The headwaters of Meyers Branch also have shown some historic habitat degradation due to artificial channelization.

Trophic modeling has shown the only metals with a potential threat are mercury (for the river otter, heron, and kingfisher) and aluminum (for the raccoon and river otter). Aluminum is related to naturally high levels in SRS soils and not unit related. Both mercury and aluminum exceeded trophic modeling thresholds in Meyers Branch which is considered a background site.

4.1 Problems Warranting Action (Early Action Only)

There are no new problems warranting action under the early action criteria.

4.2 Interim Remedial Action Objectives

- Protect the subsistence fisherman from unacceptable risk (i.e., risk > 1 x 10^{-4} or HQ >3).
- Protect ecological receptors within the IOU (stream and wetlands) from unacceptable exposure to site related contaminants and biotic contaminant tissue burdens.

4.3 Scope of the Problem Warranting Early Action

No early actions were identified based on the evaluation of SC PR6 data. The scope of future actions, if required, will be determined as the IOU continues with Phase II assessment.

4.4 Likely Early Response Actions

No early action response actions were identified based on the evaluation of SC PR6 data. Current access controls will be maintained.

4.5 Uncertainties

- New fish (for tissue body burden and assemblage data) and macroinvertebrate samples have been collected and analysis of the data is in progress. These data are used to assess the ecological health of the SC IOU. It is uncertain if the results of these bioassessment efforts will identify any revised findings associated with the ecological health of the SC IOU.

  Data Need/Evaluation: To address this uncertainty, the fish and macroinvertebrate data collected will be evaluated to assess the health of the IOU and reported in SC PR6.

- It is unknown how the biological assessments will trend over time since Phase II of the IOU program continues for several decades.

Data Need/Evaluation: Since no new contaminant sources are attributed to the SC IOU, it is likely the systems will remain relatively stable and in relatively good ecological health. However, it is important to periodically assess the health of the system. It is proposed that the ecological surveys (fish and macroinvertebrates, as deemed appropriate) continue on a periodic basis (approximately every 10-15 years) to monitor conditions within the IOU as Phase II continues. Additional sampling or surveys will be conducted if conditions warrant based on a change of status to units/sources that may potentially impact the IOU, degradation or improvements to the infrastructure or wetland/aquatic systems, and/or natural phenomenon such as prolonged drought conditions.

As with the UTR IOU, DGT samplers will be deployed in the SC IOU to assess potential contaminants within the IOU, potential threats to ecological receptors and possible consumption threats for the Human Health (HH) subsistence fisherman scenario. This will assist in problem formulation as the SC IOU continues with Phase II assessment. This will serve as a baseline for the SC IOU to direct future investigations if needed.

- It is unknown what findings the literature-based WLS will show in terms of the ecological health of the IOU as various research efforts are conducted on the SRS.

Data Need/Evaluation: It is proposed that the WLS continue to document results of IOU or IOU related ecological investigations on an annual or other periodic basis. The WLS abstracts compiled from 2014-2017 will be provided in SC PR6.

5.0 SEDIMENT AND SEDIMENT/SOIL EXPOSURE MEDIUM

The SC PR6 evaluation is based on a subset of all SC data. However, all SC analytical records are available to determine the significance of sediment exceedances. There are currently 883 new sediment records in the SC PR6 database. There are no new sediment/soil records (data) for SC PR6.

Human Health Evaluation

- There were cesium-137 benchmark exceedances for the OSW (benchmark = 14.4 pCi/g) for the Upper and Lower subunits. For the Upper subunit, there was one exceedance out of two analyses with a mean ratio of 0.74. For the Lower subunit, there was one exceedance out of five analyses with a mean ratio of 0.34.

Since the detected means were less than the benchmark (14.4 pCi/g) for both the Upper and Lower subunits, further evaluation by the IOU program is not warranted. The locations of the exceedances are in areas of known cesium-137 contamination. Administrative controls remain in place for workers in these areas.

Ecological Evaluation

The ecological benchmark screening is conducted against RSV thresholds.

- There were ecological benchmark exceedances in the Meyers Branch and Lower subunits. For the Meyers Branch subunit, there were exceedances for barium (benchmark = 60 mg/kg, one exceedance out of five analyses), DDT (benchmark = 0.007 mg/kg, two exceedances out of four analyses), DDD (benchmark = 0.0085 mg/kg, two exceedances out of four analyses), DDE (benchmark =

0.0068 mg/kg, three exceedances out of four analyses) mercury (benchmark = 0.0045 mg/kg, with four exceedances out of five analyses), and selenium (benchmark = 1.2 mg/kg, with 2 exceedances out of five analyses).

The barium exceedances for the Meyers Branch subunit had a mean ratio below 1.0 (0.54) and does not require further evaluation. However, the DDT (62.1), DDD (6.6), DDE (55.7) and mercury (16.4) exceeded mean ratios of 1.0 and require further evaluation.

There were 2 DDD exceedances (2015 data), 3 DDE exceedances (2015 data), and 2 DDT exceedances (2015 data) for SC PR6. These exceedances are all located in the Meyers Branch subunit near or within the DRRY. It is likely that there was a past use of DDT at/near the DRRY. DDT (and its metabolites, DDE and DDD) are, infrequently detected within the IOUs and are likely associated with past farming practices prior to SRS becoming federal property. DDT (and its metabolites) are persistent contaminants, and these pesticides will require further evaluation when the DDRY moves into the RI phase. The DRRY is an FFA G.1 Appendix (Site Evaluation) unit with a Site Evaluation Report submittal date of December 2035.

For mercury (benchmark = 0.0045 mg/kg) in the Lower subunit, there was one exceedance (0.0165 mg/kg) out of four analyses with a mean ratio of 4.7. The current maximum IOU background level for mercury in sediment is 0.21 mg/kg. The Lower subunit exceedance was below background and does not require further evaluation. The levels associated with the DRRY are above the background value (0.21 mg/kg). For the Meyers Branch subunit, there were four exceedances (above the background level) out of five analyses with a mean ratio of 16.4. Levels in the Meyers Branch subunit ranged from 0.0724 mg/kg to 0.0249 mg/kg. The DRRY associated mercury exceedances do require further evaluation. For selenium (benchmark = 1.2 mg/kg), the background value (5.65 mg/kg) is > both detected results (1.73 mg/kg and 1.21 mg/kg). Therefore, this constituent does not require further evaluation.

5.1 Problems Warranting Action (Early Action Only)

No early actions for sediment are warranted.

5.2 Interim Remedial Action Objectives

- Protect the OSW from unacceptable risk (risk > 1 x 10^{-4} or HQ > 3) from exposure to site related contaminants in sediment.
- Protect ecological receptors within the IOU (stream and wetlands) from unacceptable exposure to site related contaminants in sediment and biotic contaminant tissue burdens.

5.3 Scope of the Problem Warranting Early Action

No early actions were identified based on the evaluation of SC PR6 data. The scope of future actions, if required, will be determined as the IOU continues with Phase II assessment.

5.4 Likely Early Response Actions

No early action response actions were identified based on the evaluation of SC PR6 data.

5.5 Uncertainties

- There is an uncertainty with DRRY (Unit 546) being a potential source of pesticides and mercury to the Meyers Branch system. While it is not unusual to find occasional DDT (and metabolites) or mercury at elevated levels within the IOU systems, the DRRY is the only unit that is a potential contributor to Meyers Branch and is an active unit slated for investigation in the FFA with a December 2035 Site Evaluation Report submittal date. And although mercury is a regional problem due to upgradient Savannah River releases and atmospheric deposition, levels at DRRY are above current IOU background levels.

Data Need/Evaluation: This uncertainty will be addressed by ongoing studies being conducted by the Savannah River Ecology Laboratory (SREL). SREL is investigating various aspects of mercury including source contributions, levels in isolated Carolina bays and biota, and resampling suspected hot spots in the Savannah River Swamp. These efforts will assist in problem formulation for mercury as the SC IOU continues with Phase II monitoring and assessment. This uncertainty will ultimately be addressed by acquiring additional data in the areas where potential contamination may be present with the 2035 DRRY site investigation.

6.0 SURFACE WATER EXPOSURE MEDIUM

The SC PR6 evaluation is based on a subset of all data available (PR6 data). However, all data records are available to determine the significance of SW exceedances. There are currently 5,312 analytical records in the SC PR6 database for SW.

Human Health Evaluation

- The HH evaluation for SW initiates the use of MCLs as benchmark screening thresholds for the IOU program. There were SW exceedances for benzo(a)pyrene (benchmark = 0.0002 mg/L), cadmium (benchmark = 0.005 mg/L), lead (benchmark = 0.015 mg/L), thallium (benchmark = 0.002 mg/L), trichloroethylene (TCE) (benchmark = 0.005 mg/L), and tritium (benchmark = 20,000 pCi/L). The constituents with a mean ratio greater than 1.0, a frequency of exceedance > 5% (with at least 20 analyses), and with a detected mean above maximum background (or background data are non-detects and indeterminate) include benzo(a)pyrene in the Meyers Branch subunit and TCE and tritium in the Upper subunit.

TCE (mean detected value of 0.0111mg/L, mean ratio of 2.22 and a frequency of exceedance of 25%) and tritium (with a mean detected value of 224,874 pCi/L, mean ratio of 11.20, and a frequency of exceedance of 95.9%) do warrant further evaluation. Upper SC is an area with known tritium and TCE SW is being monitored in Upper SC as part of the P-Area Groundwater Operable Unit (PAGW OU).

A non-time critical removal action will be implemented at PAGW OU to reduce the mass of TCE in GW that discharges to SC. Additional monitoring has been proposed for SW under the *Sampling and Analysis Plan Addendum for P-Area Groundwater Operable Unit* (SRNS-RP-2018-00261). As such, further evaluation by the IOU program is not warranted at this time.

Exceedances of benzo(a)pyrene were located within/near the DRRY as were the ecological DDT sediment exceedances. This would indicate potential contamination that warrants further evaluation. There were only 4 samples taken during the 2015 sampling effort, and 2 of those locations resulted in SW exceedances. Although the SW is not used as a drinking water source, further evaluation of the DRRY associated samples is warranted as the SC IOU approaches Phase III of the IOU program.

Ecological Evaluation

The ecological benchmark screening is conducted against RSV thresholds.

- There were ecological exceedances for aluminum (benchmark = 0.0870 mg/L), anthracene (benchmark = 0.00002 mg/L), benzo(a) pyrene (benchmark = 0.00006 mg/L), benzo[b]fluoranthene (benchmark = 0.0026 mg/L), benzo[g,h,i]perylene (benchmark = 0.000012 mg/L), benzo[k]fluoranthene (benchmark = 0.00006 mg/L), cadmium (benchmark = 0.0001 mg/L), copper (benchmark = 0.0029 mg/L), fluoranthene (benchmark = 0.0008 mg/L), indeno[1,2,3-cd]pyrene (benchmark = 0.000012 mg/L), iron (benchmark = 1.000 mg/L), lead (benchmark = 0.00054 mg/L), manganese (benchmark = 0.0930 mg/L), nickel (benchmark = 0.016 mg/L), thallium (benchmark = 0.006 mg/L) and zinc (benchmark = 0.037 mg/L).

Constituents requiring further evaluation include various semivolatiles: anthracene, benzo(a) pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, fluoranthene, and indeno[1,2,3-cd]pyrene in the Meyers Branch subunit, and cadmium and lead in the Lower SC subunit.

The semivolatiles are all associated with the DRRY sampling effort, and as with the ecological sediment exceedances, further evaluation is warranted. Although there is a low sample size (four samples), the data indicate contamination may be present.

A review of all the SC PR6 cadmium data for SW in the IOU database for Lower SC revealed of the 58 analyses for cadmium, only one result is above background. Similarly, a review of the 58 analyses for lead revealed one result above background. As such, cadmium and lead do not require further evaluation.

6.1 Problems Warranting Action (Early Action Only)

There are no new problems warranting action under the early action criteria.

6.2 Interim Remedial Action Objectives

- Protect hypothetical resident from unacceptable exposure to contaminants in SW (drinking water MCLs).
- Protect ecological receptors within the IOU (stream and wetlands) from exposure to site related SW contaminants and biotic contaminant tissue burdens.

6.3 Scope of the Problem Warranting Early Action

No early actions were identified based on the evaluation of SC PR6 data. The scope of future actions, if required, will be determined as Phase II continues.

6.4 Likely Early Response Actions

No early response actions were identified.

6.5 Uncertainties

- There is an uncertainty with DRRY source of semivolatile constituents upgradient of Meyers Branch headwaters. Although there were only 4 sampling points, the Y-02 outfall associated sampling location (inside DRRY boundary, western side) and a location further down gradient toward/in Meyers Branch (west of DRRY near crossing of Meyers Branch and unpaved trail 62-25 Road) had various semivolatiles present above RSVs. These two locations also had human health SW MCL exceedance for benzo(a)pyrene.

Data Need/Evaluation: This uncertainty will be addressed by acquiring additional data in the areas where potential contamination may present with the DRRY 2035 site investigation.

7.0 IOU STRATEGY

The IOU ecological and human health benchmarks were updated upon approval of the *Remedial Investigation/Baseline Risk Assessment for the Lower Three Runs Operable Unit (U)* (SRNS-RP-2017-00139, Revision 1, December 2017).

As Phase II continues, IOU data, new OU information, and pertinent OU characterization data will be incorporated into the SC IOU GIS project, and periodic assessment will be conducted to refine the CSM. Phase III of the SC IOU (completion of the RI/Feasibility Study [FS]) will be conducted after remedial decisions for the OUs in the SC watershed have been made. The Phase III field start (initiating the RI/BRA, FS, and ROD) is currently scheduled to begin in fiscal year 2059.

The SC IOU is the first IOU to reach the sixth PR milestone. Over time, the Phase II assessment program has realized a reduction in IOU initiated sampling, and periodic reports now primarily report a compilation of data from other data stewards. In addition, the recent completion of the LTR RFI/BRA demonstrated that the historical information still required extensive characterization data prior to Phase III assessment.

SRS proposes that the approach to Phase II assessment and reporting be re-evaluated with the Core Team prior to submittal of the next PR (Pen Branch PR 5 due September 2019) to provide a more meaningful reporting tool for the IOU program.

8.0 RECORD OF CORE TEAM AGREEMENTS AND KEY CHANGES

This section includes a Record of Core Team Agreements and Key Changes to the scoping summary.

RECORD OF KEY AGREEMENTS	
Date	**Description of Agreement**
February 2018	The Lower Three Runs Scoping Summary documented that the IOU ecological and human health benchmarks will be updated pending approval of the *Remedial Investigation/Baseline Risk Assessment for the Lower Three Runs Operable Unit (U)*, (SRNS-RP-2017-00139). It is anticipated that the revised benchmarks will be used in the upcoming Steel Creek PR 6 report due for submittal in September 30, 2018 and future PRs.
December 3, 2003	<u>PR2 Scoping Meeting</u> 1. The Core Team agreed at the scoping meeting to conduct NaI screening with confirmation gamma speciation at SC-2A and adjacent depositional area. 2. The Core Team agreed that no new surface water or fish sampling was needed at this time. 3. The Core Team was in agreement with adding P Area Discharge Canal to the SC IOU. Note that L-Lake and L-Area Discharge Canal are already part of the SC IOU. 4. The Core Team agreed that the following two uncertainties have been resolved and were hence removed from the uncertainty discussion. a. The uncertainty associated with nonvolatile beta values that exceeded the 50 pCi/g trigger level in sediment was managed by performing nonvolatile beta speciation analysis. Results indicated there

	are no individual nonvolatile beta emitting radionuclides exceeding human health or ecological benchmarks. The laboratory did not provide the requested analyses for Carbon-14, Nickel-63, Technetium-99, and Iodine-129. However, based on previous environmental investigations at SRS, these radionuclides do not show up as Contaminants of Concern. Additionally, these four radionuclides were evaluated upstream in the headwaters of SC (at the source area), and no human health or ecological benchmark exceedances were observed. No sampling at these locations will be done. b. The uncertainty associated with alpha-emitting trigger levels that were exceeded at SC-4A was managed by performing alpha speciation analysis at SC-4A where the 15 pCi/L trigger level was exceeded. Results indicated there are no individual alpha emitting radionuclides exceeding human health or ecological benchmarks.
March 11, 2003	<u>IROD/IAPP Design Team Meeting</u> • The Core Team agreed at the 3/11/03 Design Team Meeting to develop a Fact Sheet that describes the removal action of placing warning signs in areas of the IOUs that exceed human health benchmarks.
January 8, 2003	<u>Four Mile Branch Scoping Meeting</u> 1. SRS will evaluate an IOU program-wide IAPP/IROD strategy for the implementation of Interim actions. This will be presented for Core Team discussion at the February 19, 2003 Steel Creek IOU IAPP/IROD Scoping Meeting. 2. The Core Team agreed to staggering the submittal of periodic reports to February, April and June (e.g. in 2004, Steel Creek Periodic Report 2 - February, Pen Branch Periodic Report 1 - April, and Lower Three Runs Periodic Report 1 - June).

November 18, 2002	Steel Creek PTSM Discussion 1. The IOU program will utilize the EPA PRG calculator (http://epa-prgs.ornl.gov/radionuclides/prg_search.shtml). 2. No PTSM evaluation is required. Early action determinations will continue to be performed consistent with current IOU protocols.
January 16, 2002	Design Team Meeting 1. Steel Creek Swamp Area and Creek Plantation were removed from the Steel Creek IOU and included in the Savannah River IOU. 2. Various locations in the vicinity of the Steel Creek headwaters exceeded the human health benchmark 3. The Core Team agreed that the proposed early action would include defining an interim remedial action objective, and selecting likely response actions. 4. Based on the existing dataset, the lateral extent of cesium-137 in sediment and sediment/soil exceeding the 10^{-4} human health benchmarks is adequately established, and no additional sampling is proposed at this time. However, additional sampling may be required to support the evaluation associated with the IAPP/ IROD. Note: Subsequent Core Team discussions resulted in agreement for further evaluation of the cesium contamination above SC-2A. 5. The L Lake/Old L Area Discharge Canal OU will be combined with the Steel Creek IOU and will no longer be considered separate operable units. 6. For the next Periodic Report the adolescent trespasser scenario will be replaced with the on-site worker for surface water to be consistent with the other IOUs in applying the most realistic conservative scenario.

KEY CHANGES TO SCOPING SUMMARY			
Date	**Section**	**Description**	**Rationale for Change**
July 2018	All	Updated all sections of scoping summary based on SC PR6 data. The scoping summary reflects the updated benchmarks following the approach used in the *Remedial Investigation/Baseline Risk Assessment for the Lower Three Runs Operable Unit (U)*, (SRNS-RP-2017-00139).	Scoping summary revised to support SC PR6.

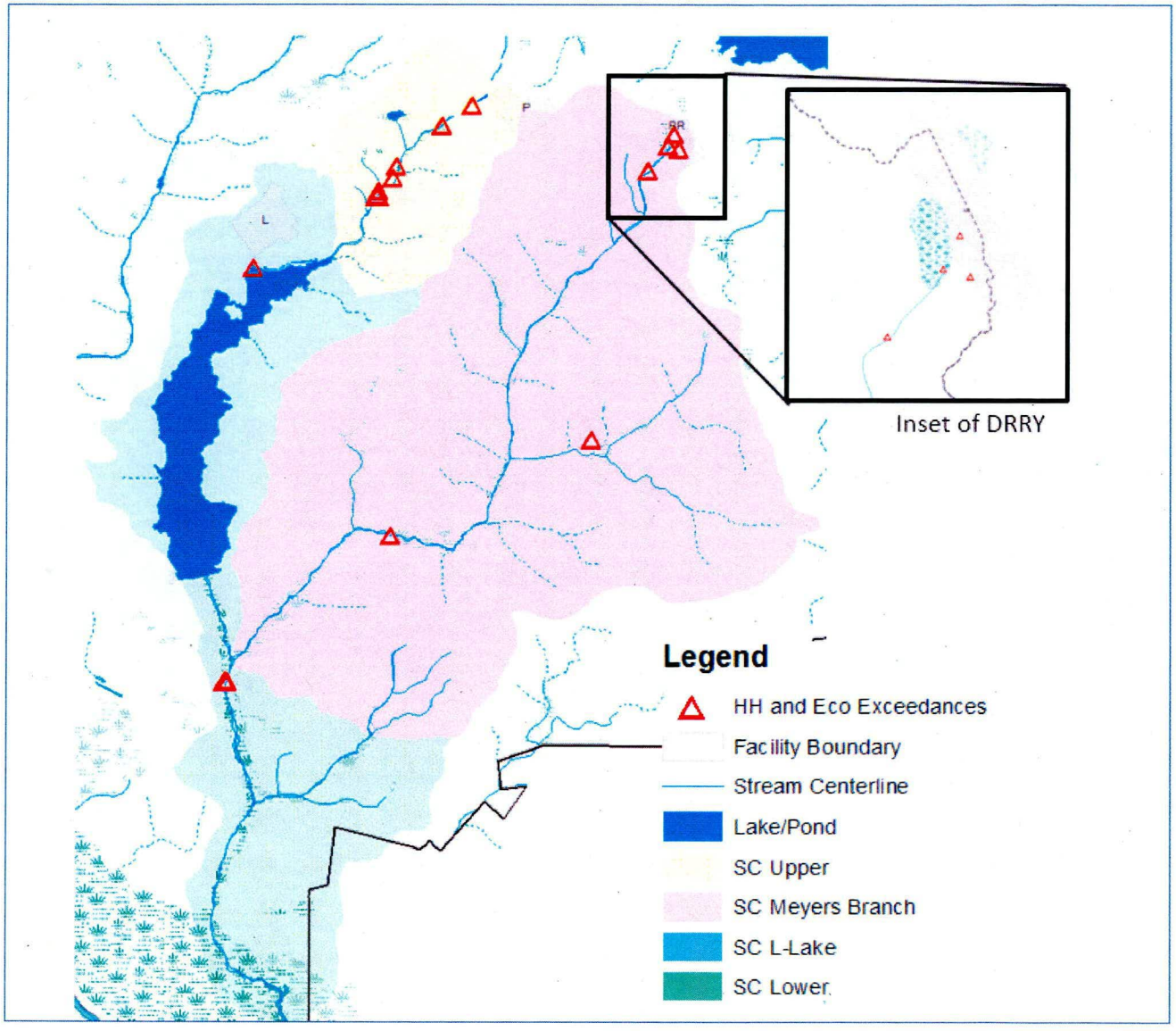

Figure 1. Steel IOU