

## A.1 Technology Name

### Radiello Passive Sampler

#### A.1.1 Source

2022 Annual Operations & Maintenance Report for Area 40, Arcadis U.S. Inc., March 31, 2023

#### A.1.2 Summary

<b>Media:</b>	Ambient Air
<b>Study Type:</b>	Remedy Evaluation
<b>Technology:</b>	Radiello Sampler
<b>Peer Reviewed:</b>	No
<b>Publication Date:</b>	March 31, 2023

#### A.1.3 Site Description

##### General site description and conditions

The Site was the location of historic gold dredging activities in the late 1800's to early 1900's. From the 1950's through the 1970's rocket motor manufacturing, non-destructive testing, cleaning and degreasing, bulk chemical storage, and other activities resulted in release of chlorinated chemicals into the soil and groundwater. By the 1980's to 1990's most manufacturing and testing operations have ceased, and most buildings were demolished by the 2010's. Complete Site demolition and future redevelopment is planned.

##### Contaminants of concern (COCs)

COCs for the Site include perchlorate and volatile organic compounds (VOCs) such as trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethene (1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), vinyl chloride, and Freon 113. Some VOCs were detected in the vadose zone beneath some of the potential source areas and the former separation ponds.

##### Sampling frequency of COCs

For this study, quarterly samples were collected from the fall of 2019 through the winter of 2022 in approximately 19 sampling locations at 2 feet and also at 4 ft above ground surface. Future long-term annual ambient air monitoring is planned for this Site.

##### Technology Used

Radiello 130 passive sampling devices were deployed for approximately 2 weeks, and samples were collected at 2 and 4 feet above ground surface. Analysis of VOCs was by modified U.S EPA Method TO-17.

30

#### 31 A.1.4 Remedial Phase

32 The purpose of this sampling was to evaluate post-remedy ambient air conditions. Radiello 130  
33 passive sampling devices were used to monitor ambient air in and around the primary source  
34 area or area of concern (AOC) at the Site, to determine whether Site cleanup goals have been  
35 met. The sampling results were also compared to ambient air samples collected to establish  
36 background VOC concentrations that are not related to the AOC.

#### 37 A.1.5 Outcome

38 As TCE concentrations in ambient air at all locations were approximately an order of magnitude  
39 higher than those of any other compound, TCE results were proposed as a surrogate for total  
40 VOCs or PCE concentrations. Reported TCE concentrations ranged from  $<0.072 \mu\text{g}/\text{m}^3$  (not  
41 detected above laboratory reporting limit) to  $10 \mu\text{g}/\text{m}^3$ . Reported PCE concentrations ranged  
42 from  $<0.083 \mu\text{g}/\text{m}^3$  (not detected above laboratory reporting limit) to  $0.98 \mu\text{g}/\text{m}^3$ . Other reported  
43 VOC concentration ranges included ethylbenzene ( $<0.072 \mu\text{g}/\text{m}^3$  to  $0.11 \mu\text{g}/\text{m}^3$ ), toluene ( $0.1$   
44  $\mu\text{g}/\text{m}^3$  to  $0.82 \mu\text{g}/\text{m}^3$ ), m,p-xylene ( $<0.071 \mu\text{g}/\text{m}^3$  to  $0.30 \mu\text{g}/\text{m}^3$ ), chloroform ( $<0.066 \mu\text{g}/\text{m}^3$  to  
45  $0.083 \mu\text{g}/\text{m}^3$ ).

46 During the reporting period, TCE and PCE concentrations in ambient air samples collected near  
47 the AOC remained relatively stable. For the 202 to 2021 reporting period, TCE and PCE were  
48 reported to slightly increase in March 2020 through August 2021 and TCE concentrations  
49 decreased in November 2021. A similar trend was reported for the 2021 to 2022 reporting  
50 period, with TCE and PCE concentrations increasing in March 2021 to September 2022,  
51 followed by a decrease in TCE concentrations after a precipitation event in November 2022. An  
52 increase in volatilization of VOCs in groundwater through clean backfill material in the AOC was  
53 suggested to contribute to this observed trend. Volatilization of VOC mass in soil and/or  
54 groundwater during the warmer, drier summer months is likely to be higher than during the  
55 cooler and wetter winter months.

56 The Report concluded that trend evaluation of TCE and PCE concentrations in ambient air  
57 samples collected from the transition zone along the AOC suggested that residual COC  
58 concentrations at the AOC are not likely to result in exceedances along the transition zone.  
59 During the reporting period, TCE and PCE concentrations reported in ambient air sampled from  
60 the transition zone slightly increased from March 2020 to August 2021 and from March 2022 to  
61 September 2022. These periods were followed by a decrease in TCE concentration after a  
62 precipitation event in November 2021 and 2022. The Report suggested that increased ambient  
63 air concentrations in the areas nearer the source area/AOC may have been pushed towards the  
64 transition zone by prevailing winds.

65