

### **3.6 Groundwater Contamination**

This section discusses contaminant levels in groundwater of the ICGFS. A general description of contaminant origin is provided along with a description of subsurface contaminant distribution.

#### **3.6.1 Source Areas**

Numerous characterization investigations, including the TCE Still Area RFI, Plating Building RFI, and the Underground Tank Farm Corrective Action Plan, have identified the former TCE Still, Classified Waste Burial Trenches, the Oil House, the former Chip Handling Building, the Sales Building, former Department 95 (D/95), the Abandoned Sump/Waste Transfer Spill Area, the former Plating Building area, and the former Underground Tank Farm and Abandoned Fuel lines as sources of contamination within the ICGFS (DOE 1989, 1990c, 1994, 1993c, 1993d, 1993b) (Fig. 3.1). Another source area investigated but not designated a SWMU that is equally dominant as a contaminant source in this flow system is the area of a former vapor degreasing pit in the former Plating Building which was discussed in the Plating Building RFI Report (DOE, 1993c). The source of this contamination is concentrated in and around monitoring well 192 and pumping well 276 just outside the eastern edge of the MMB (Figure 3.1). Originally, a TCE vapor degreaser, the unit operated from 1957 through 1985. In 1976 it was converted to a perchloroethylene degreaser.

The Building 50 area (former fuel test lab) located just east-northeast of the West Boilerhouse is also a source of chlorinated solvent contamination.

#### **3.6.2 Contaminant Distribution and Extent**

Historical groundwater sampling results have demonstrated that there are three organic compounds of primary concern in groundwater at the KCP: TCE, and its anaerobic degradation products 1,2-DCE and vinyl chloride. In general, if contamination is detected within the ICGFS, the concentrations of these primary contaminants will be the highest present. The horizontal and vertical extent of other contaminants will, in general, be equal to or less than the horizontal and vertical extent of the primary contaminants. Figures 3.5-3.10 display the vertical and horizontal extent of each of the primary organic contaminants in ICGFS upper and lower monitor well completions for the 2011-second semi-annual sampling event.

Figures 3.11 through 3.14 show the vertical and horizontal extent of 1,1-DCE and 1,1-DCA in the ICGFS. These compounds are the fourth and fifth most common groundwater contaminants at the KCP.

The zero-concentration boundary in contaminant figures is inferred and is somewhat arbitrary. Routinely, placement of the zero-concentration boundary is approximately halfway between a contaminated well and the closest well where no contamination was detected. In some cases, it is necessary to estimate plume extent using wells that contain only low or sporadic contamination. Historical knowledge of previous environmental investigations and groundwater sampling data by the author is also utilized.

Each compound specific contaminant figure shows the presence and extent of contamination at levels both above and below its site specific clean up level. That is, the reader can see by plume color the extent of the contaminant plume that exceeds site clean-up standards.

The figures also show potentiometric surfaces to augment understanding of contaminant movement. A discussion of each figure is provided. Table 3.2 is provided at the end of this section that shows detections of all compounds in all ICGFS wells in 2011.

Contaminant trend graphs for selected ICGFS wells are also provided as an attachment to this section.

### **3.6.2.1 TCE, Upper Completion Wells**

Only three source areas within the ICGFS exhibit upper completion contamination. They are as follows: The area near well 69 corresponding to the former TCE Still Area (SWMU 2), the area near well 209 defined by releases from the Abandoned Sump (SWMU 37) and the area defined by TCE in well 192 derived from the former Plating Building Degreaser. As discussed previously, TCE is the primary source contaminant released to the environment at the KCP that impacts groundwater. The fact that only three ICGFS locations exhibit upper completion TCE contamination suggests that historical releases of TCE have migrated to depth and have degraded over time into the TCE degradation products 1,2-DCE and vinyl chloride (see Figs. 3.7 and 3.9).

TCE was detected in well 69 at 76.2 µg/L and at 74,600 µg/L in well 192U located immediately east of the MMB near the former Plating Building degreaser. Contamination from these source areas flows to building footing tile drains or to pumping well 276 which defines the downgradient extent of upper completion TCE contamination.

Monitoring wells 115, 116 and 163 located in the north central portion of the MMB historically detected TCE in their upper completions. However, over time the upper completions have each shown reductions in TCE. These reductions are believed to be primarily due to the downward migration of contamination within the unconsolidated water bearing zone at the facility. As TCE/1,2-DCE /vinyl chloride ratios remain consistent over all.

Well 209 detected TCE at 1.4 µg/L. Contamination present in this well primarily flows southwesterly toward the Building 91 drain.

No TCE plume is drawn in the area of Building 50 due to the fact that no upper completion wells were installed in this area. However, based on results from lower completion wells a upper completion TCE plume can be inferred.

The TCE cleanup standard at the KCP is 5 µg/L. Compliance point wells are 202, 195, 196, 197, 198, and 73. Site clean-up standards were met in all compliance point wells.

### **3.6.2.2 TCE, Lower Completion Wells**

Building 50, the former Plating Building Degreaser, the TCE Still Area, the Maintenance Vehicle Repair Shop Sump and the former Tank Farm/Building 15 area comprise the primary areas with elevated TCE levels in lower well completions.

The Building 50 area exhibits elevated TCE concentrations in wells 505, 504, 503 and 509. The plume, shown in Figure 3.6 appears to be primarily influenced by the groundwater depression created by the WBH footing tile drains. The southern extent of the lower completion TCE plume in this area enters the northwest corner of the MMB and is captured by building footing tile drains. Well 157 in the northwest portion of the MMB has not detected TCE since 2006 while well 508 noted a TCE concentration of 3.5 µg/L, below the site standard of 5µg/l. indicating it lies on the periphery of the plume in this area.

The primary source area for TCE contamination in the ICGFS is the former vapor degreaser location near monitoring well 192 and pumping well 276 on the east edge of the MMB. Two other wells adjacent to these wells 185 and 33 also exhibit elevated TCE concentrations ranging from 74,600 µg/L in well 192L to 171 µg/L in well 33 L. The downgradient extent of the TCE plume is drawn in Figure 3.6 as a sliver of contamination running between wells 35 and 165 southeastward, skirting well 193, through well 199 and entering pumping well 235. This plume may actually be cut off between wells 165 and 35 along the ridge of the axis of elevated groundwater in this area.

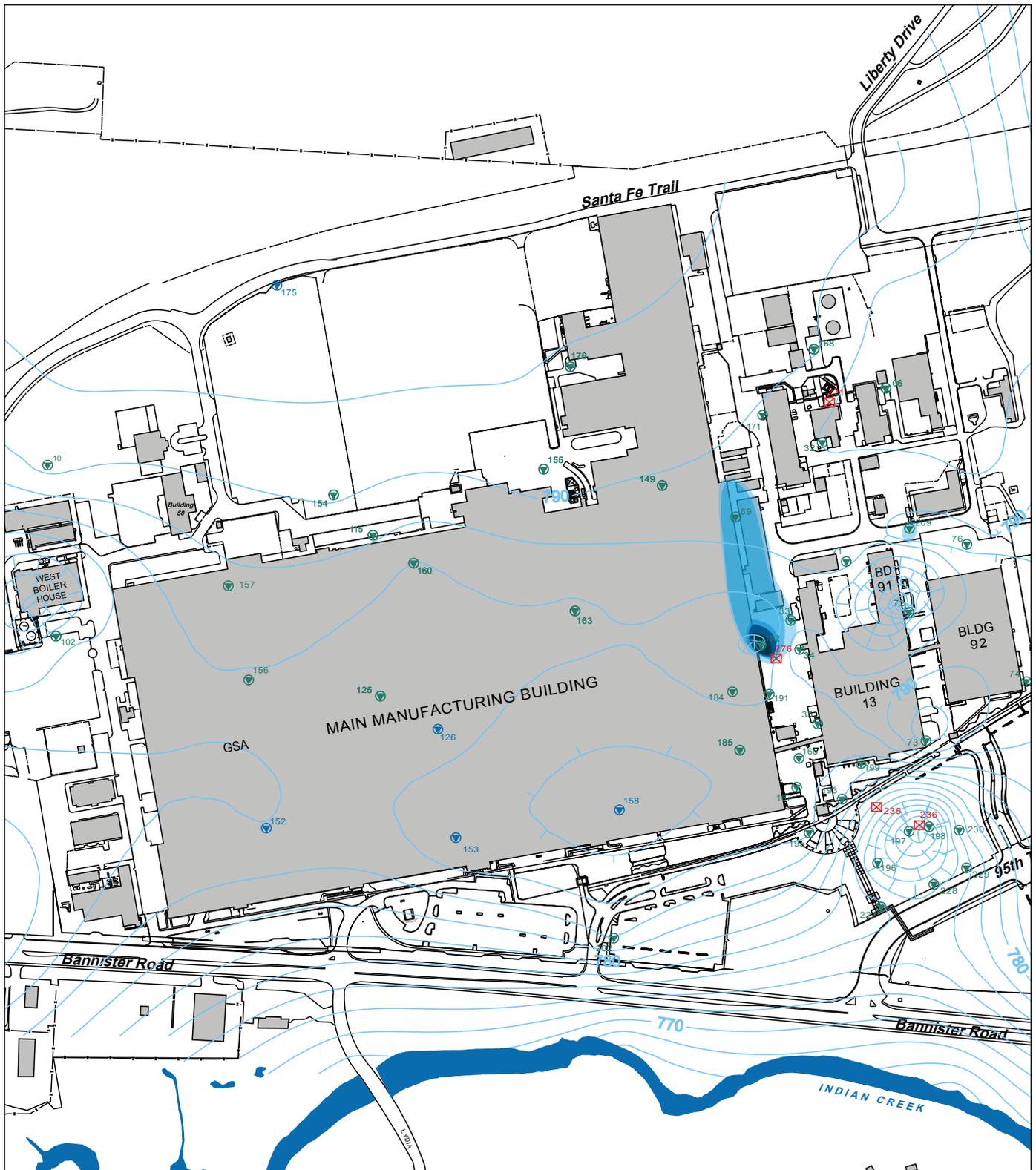
Well 176 defines the northern upgradient extent of contamination in the ICGFS (Fig. 3.6) corresponding to release from the Maintenance Vehicle Repair Shop Sump.

An area of low to moderate contamination was again noted in wells located in the north central perimeter of the MMB derived from the former Chip and Sales Building (SWMUs 16 and 40) and the former D/95 area defined by wells 115, 160 and 163 ranging from 14.8 µg/L in well 115 to 200 µg/L in well 160.

Another component of the TCE plume in this flow system originates at the Abandoned Sump in the far eastern end of the flow system in well 209 at 4.9 µg/L. Contamination from this location runs southward to the Building 91 sump and has been decreasing overall in concentration since 2006.

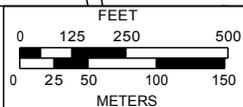
Other areas of TCE lower completion contamination are noted from pumping well 271 adjacent to the former Underground Tank Farm/Building 15 area at 151 µg/L.

The TCE cleanup standard at the KCP is 5 µg/L. This standard was not exceeded in any ICGFS compliance point well.



**TCE Concentrations**

- Light blue: 1 to 5 µg/L
- Light blue: 5 to 100 µg/L
- Medium blue: 100 to 1,000 µg/L
- Dark blue: 1,000 to 10,000 µg/L
- Very dark blue: 10,000 to 100,000 µg/L



- ▼ In-service monitoring well location
  - ▼ In-service water level only
  - ⊠ In-service interceptor well location
- Contour Interval: 2ft.



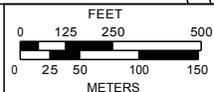
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 Name: Corrective Action Report  
 Drawing Figure 3.5: Indian Creek Flow System Upper Completion  
 Name: TCE Contamination, Fall 2011  
 Date: 02/01/2012



**TCE Concentrations**

- mdl to 5 µg/L
- 5 to 100 µg/L
- 100 to 1,000 µg/L
- 1,000 to 10,000 µg/L
- 10,000 to 100,000 µg/L
- > 100,000 µg/L



- In-service monitoring well location
- In-service water level only
- In-service interceptor well location

Contour Interval: 2ft.



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 Name: TCE Contamination, Fall 2011  
 Date: 02/01/2012

### **3.6.2.3 1,2-DCE, Upper Completion Wells**

1, 2-DCE is the most prevalent contaminant compound in KCP groundwater. Its presence is a direct result of the breakdown of TCE over time in the subsurface environment.

Well 69 immediately south of the former TCE Still Area and well 192 near the former Plating Building degreaser again define two primary areas of 1,2-DCE contamination in this flow system at 74.2 and 107,000 µg/L (Figure 3.7). 1, 2-DCE concentrations continue to decrease over time in well 69 while little change is noted over time in well 192. This contamination is captured by building footing tile drains and/or from pumping well 276. The 1, 2-DCE plume is drawn downgradient of pumping well 276 encompassing the area surrounding well 184 inside the east edge of the MMB extending southeastward through well 165 toward pumping well 235. 1,2-DCE contamination in these upper completion wells are all below site clean-up standards

Other areas of elevated 1,2-DCE concentration are found in the area of well 209 at the Abandoned Sump at 192 µg/L. This area of contamination flows toward the Building 91 footing tile drain system and has been decreasing over time.

Wells 115, 160 and 163 in the north-central portion of the MMB continue to show low to moderate levels of contamination derived from the former Chip and Sales Building (wells 115 and 160) and, in the case of well 163, the former Department 95 Area. Contamination in these wells ranges from 51.8 to 362 µg/L with the highest concentration detected in well 160.

1, 2-DCE is also present through the northwest corner of the MMB and in the area of Building 50 just east of the West Boilerhouse. Building 50 area upper completion contamination is inferred from lower completion results. Unlike the upper completion drawing for TCE at Building 50, a plume is drawn in this area for 1,2-DCE to allow reader understanding of the source of 1,2-DCE. As stated previously, this contamination is believed to be captured by a combination of MMB and West Boilerhouse footing tile drains.

A small area of 1,2-DCE is shown in the area of well 32 southwest of pumping well 271 at a concentration of 5.2 µg/L. Contamination in this well is derived from the former Abandoned Fuel Lines.

1,2-DCE contamination was also noted in monitoring well 125 near Department 71 at 1.3 µg/L consistent with historical results.

The 1,2-DCE cleanup standard at the KCP is 70 µg/L. Compliance point wells are 202, 195, 196, 197, 198, and 73. 1,2-DCE clean-up standards were met in all upper completion compliance point wells.

### **3.6.2.4 1,2-DCE, Lower Completion Wells**

1,2-DCE contamination in lower completion wells is present under much of the MMB.

Elevated concentrations of 1,2-DCE were noted in well 69 located near the former TCE Still at 7670 µg/L, and monitoring well 192 near the former plating building degreaser at 18,100 µg/L,

respectively (Figure 3.8). 2,790 µg/L of 1, 2-DCE was noted from well 184 just southwest of pumping well 276 (Fig. 3.8). This portion of the plume is captured by a combination of pumping from well 276 and building footing tile drains.

Other 1, 2-DCE sources include the Chip and Sales Building monitored by wells 160, 115 and the former D/95 area monitored by well 163. These wells detected 1,2-DCE at 1620, 186 and 256 µg/L, respectively.

The easternmost extent of the 1, 2-DCE ICGFS lower completion plume is marked by contamination present in wells 6L and 76L. Groundwater from well 6 flows toward pumping well 271. Contamination in well 76 is of concern in that it marks the eastern boundary of contamination in the ICGFS and is predominantly outside the influence of any pumping well. Fortunately, through a combination of the action of the Building 91 sump and the groundwater mound located just east of this well, groundwater near well 76 flows southwestward toward the BD 91 sump (Fig 3.8). Contamination in well 76 has been consistently detected since 1992.

The northern extent of 1, 2-DCE lower completion contamination was defined by well 176 near the MVRSS (SWMU 36) and well OW-1. An exact source for contamination in well OW-1 is unknown. 1,2-DCE concentrations have been slowly increasing in this well. This contamination flows southeastward toward pumping well 271.

1,2-DCE was also noted in well 171 related to contamination derived from the former Abandoned Fuel Lines. Pumping well 271 just to the east of monitoring well 171 serves to capture contamination from this area as well as any residual contamination from the former Underground Tank Farm. 1,2-DCE was also noted in well 209 at the Abandoned Sump at 192 µg/L (Fig. 3.8).

The southern downgradient extent of 1,2-DCE contamination is defined by pumping wells 235 and 236 which detected 1,2-DCE at 847 and 2.1 µg/L, respectively (Fig. 3.8).

Sampling of the nine monitoring wells in the Building 50 area was conducted as a part of the second semi-annual sampling event. Results again reveal that a separate distribution exists for 1, 2-DCE in this area than that for TCE. Well 505 which exhibited the highest concentration of TCE in this area was virtually void of 1, 2-DCE being present only at 7.8 µg/L. The highest concentration of 1, 2-DCE in the Building 50 area was found in well 502 at 16,200 µg/L with the next highest concentration being found in wells 503 and 508 located just to the north and south of this well at 452 and 454 µg/L, respectively. This contamination flows toward and into the WBH footing tile drains.

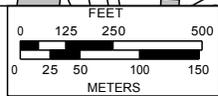
Of note is that monitoring well 158 in the southeast quadrant of the MMB was sampled during the second semi-annual sampling event and detected 1,2-DCE at 2.4 µg/L. (Fig 3.8). This result was confirmed upon resampling. This well will be sampled in 2012 to determine if a trend exists. This well is located within the groundwater mound that exists in the southeast quadrant of the MMB.



**1,2-DCE Concentrations**

- mdl to 70 µg/L
- 70 to 100 µg/L
- 100 to 1,000 µg/L
- 1,000 to 10,000 µg/L
- 10,000 to 100,000 µg/L

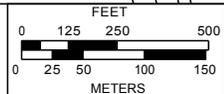
- V In-service monitoring well location
  - V In-service water level only
  - X In-service interceptor well location
- Contour Interval: 2ft.



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 Drawing Figure 3.7: Indian Creek Flow System Upper Completion  
 Name: 1,2-DCE Contamination, Fall 2011  
 Date: 02/01/2012



- mdl to 70  $\mu\text{g/L}$
- 70 to 100  $\mu\text{g/L}$
- 100 to 1,000  $\mu\text{g/L}$
- 1,000 to 10,000  $\mu\text{g/L}$
- 10,000 to 100,000  $\mu\text{g/L}$



- In-service monitoring well location
- In-service water level only
- ⊠ In-service interceptor well location

Contour Interval: 2ft.



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Project Name: 2011 Annual Groundwater Corrective Action Report  
 Drawing Name: Figure 3.8: Indian Creek Flow System Lower Completion 1,2-DCE Contamination, Fall 2011  
 Date: 02/08/2012

The 1,2-DCE cleanup standard at the KCP is 70 µg/L. Compliance point wells are 202, 195, 196, 197, 198, and 73. The standard was met in all compliance point wells.

#### **3.6.2.5 Vinyl chloride, Upper Completion Wells**

Upper completion vinyl chloride contamination was noted in well 163 (D/95 - SWMU 39) at 7.5 µg/L and well 115 from the former Chip and Sales Building area at 2.6 µg/L.

Well 192U has historically detected contamination by vinyl chloride in the range of several hundred parts per billion. However, due to the level of contamination in the well, sufficient dilutions occurred during analysis process to raise the detection limit above the level of the vinyl chloride concentration. Figure 3.9 was nevertheless drawn to show VC in the upper completion of well 192.

A small-localized area of contamination is noted in well 125 at 7.8 µg/L derived from historical operations in what is now Department 71. Well 209 near the abandoned sump detected vinyl chloride at 171 µg/L. Well 71U located just to the west of well 209 detected vinyl chloride at 7 µg/L.

Upper completion vinyl chloride contamination is believed to be present in the area of Building 50 (the former fuels test lab) though it was not drawn in Figure 3.9. The MMB and West Boilerhouse footing tile drains capture contamination from Building 50. Building footing tile drains also assist in the capture of contamination inside the MMB. Upper completion contamination can be inferred from data derived from lower completion wells. No upper completion wells exist in this area.

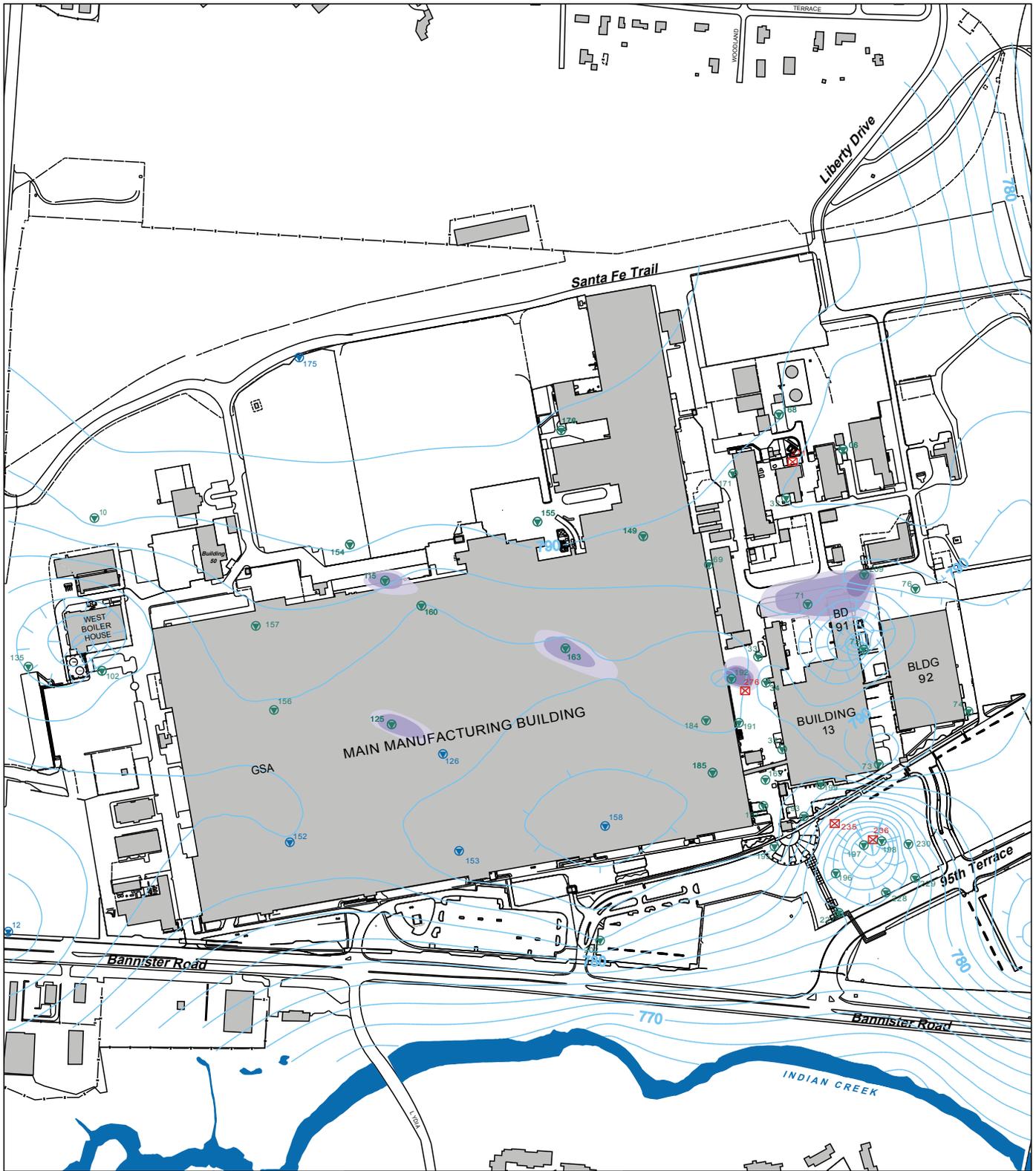
The vinyl chloride clean up standard was not exceeded in ICGFS upper completion compliance point wells in 2011.

#### **3.6.2.6 Vinyl chloride, Lower Completion Wells**

Vinyl chloride was not formally detected in well 192L near the former plating Building degreaser due to the fact that the sample detection limit was adjusted upward as a result of sample dilution in order to maintain instrument calibration. Historical concentrations from the well have averaged in the 100's of ppb. This issue also occurred with results from pumping well 276. The plume was nevertheless drawn to show vinyl chloride contamination in these wells.

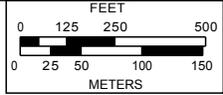
North of well 192 monitoring well 69 serves to monitor releases from the former TCE Still. This well detected vinyl chloride at 1140 µg/L.

Vinyl chloride was detected at 912 µg/L in well 209 located immediately downgradient of the former Abandoned Sump. This well marks the eastern extent of vinyl chloride contamination in this flow system. Vinyl chloride contamination was also present west of well 209 in well 71. The source of this contamination in this well is unknown. It may be related to migration of contamination along buried utilities in the area.



**Vinyl Chloride Concentrations**

- mdl to 2 µg/L
- 2 to 100 µg/L
- 100 to 1,000 µg/L



- ▼ In-service monitoring well location
  - ▼ In-service water level only
  - ⊠ In-service interceptor well location
- Contour Interval: 2ft.



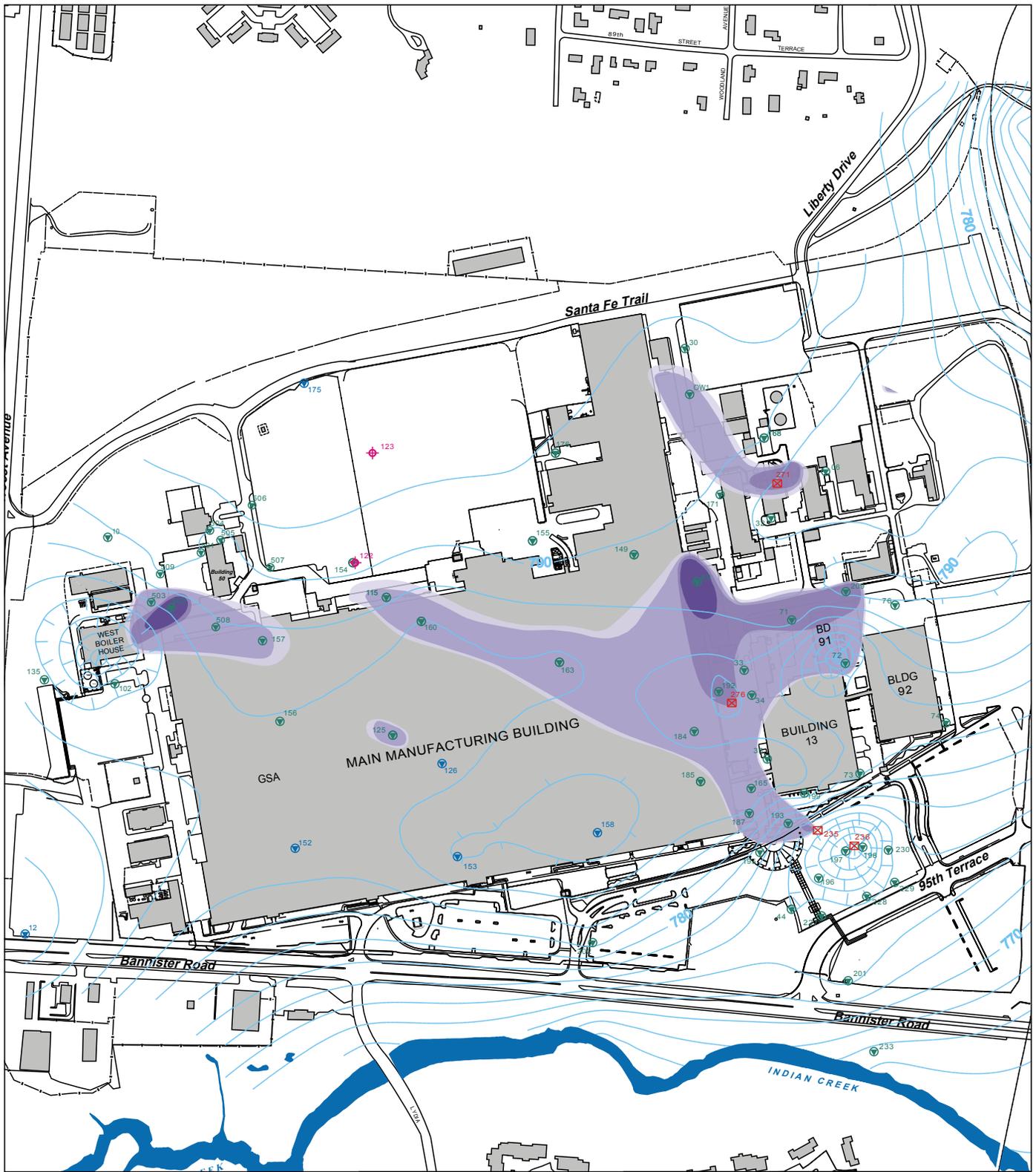
**Kansas City Plant**  
National Security Asset



**NNSA**  
National Nuclear Security Administration

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Drawing Figure 3.9:	Indian Creek Flow System Upper Completion
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Date:	02/01/2012

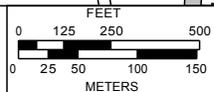


**Vinyl Chloride Concentrations**

- mdl to 2 µg/L
- 2 to 100 µg/L
- 100 to 1,000 µg/L
- 1,000 to 10,000 µg/L
- > 10,000 µg/L

- In-service monitoring well location
- In-service water level only
- In-service interceptor well location

Contour Interval: 2ft.



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 Drawing Figure 3.10: Indian Creek Flow System Lower Completion  
 Name: Vinyl Chloride Contamination, Fall 2011  
 Date: 02/01/2012

Well OW1 detected vinyl chloride at 14 µg/L. This well continues to mark the northern upgradient extent of lower completion vinyl chloride contamination in the ICGFS. Contamination in this well flows southeastwardly in the direction of pumping well 271.

Contamination was noted in wells 115, 160 and 163 in the north central portion of the MMB at 2.6, 5.2 and 75.1 µg/L, respectively. These wells define the upgradient extent of vinyl chloride contamination in the north central part of the MMB.

A small localized area of low level vinyl chloride contamination was noted in well 125 in the central portion of the MMB at 8.7 µg/L near the Department 71 area.

The downgradient extent of vinyl chloride contamination is noted from monitoring well 193 and 187 along with pumping well 235 (Fig. 3.10) ranging in concentrations from 20.3 to 101 µg/L.

Similar to that found for 1,2-DCE, vinyl chloride was detected at elevated concentrations in well 502 in the Building 50 area at 7,730 while vinyl chloride was absent entirely from wells installed on the northeast side of the building in the area which exhibited significant contamination by TCE (e.g., well 505). Vinyl chloride was also detected in adjacent wells 508, 503 and 157 at 16.2, 23.3 and 2.7 µg/L, respectively. Contamination in this area flows toward and into the West Boilerhouse footing tile drain and/or the MMB footing tile drains.

Building footing tile drains capture vinyl chloride contamination present inside the MMB. Contamination derived from the Building 50 area is either captured by WBH or MMB footing tile drains. Pumping well 235 captures vinyl chloride contamination in the SEPL preventing off site migration to Indian Creek.

#### **3.6.2.7. 1,1-Dichloroethene Upper Completion Wells**

1, 1-DCE upper completion contamination in the 2011 second semi-annual sampling was present in one area (Fig. 3.11). Specifically, well 192 at 189 µg/L. This contamination likely flows toward pumping well 276. No other 1, 1-DCE contamination was found in the second-semi-annual sampling event.

#### **3.6.2.8 1,1-Dichloroethene Lower Completion Wells**

Many of the same source areas that contributed to contaminant plumes described above for other contaminant compounds, defined lower completion ICGFS 1,1-DCE contamination in 2011 (Fig. 3.12). Specifically, the TCE Still Area, Abandoned Sump and Abandoned Fuel Lines and the former D/95 area and Building 50 (Fig. 3.12, Table 3.2).

The northern (upgradient) extent of 1, 1-DCE contamination is again defined by pumping well 271 at 2.3 µg/L and in well 32 just south of pumping well 271 at 3.3 µg/L all associated with the former Abandoned Fuel Lines or in the case of pumping well 271 the former Underground Tank Farm.

Well 209 near the Abandoned Sump detected 34.7 µg/L of 1, 1-DCE. This contamination migrates southward to the Building 91 footing tile drain sump.

Low level 1,1-DCE contamination was noted from three wells in the Building 50 area. Three of the wells that exhibited Vinyl chloride and 1, 2-DCE contamination (502, 503 and 508) detected 1,1-DCE at concentrations ranging from 1.3 to 23.9 µg/L.

Well 69 detected 1, 1-DCE at 26.4 µg/L. The downgradient extent of 1, 1-DCE was again marked by well 184 in the south portion of the MMB at 13.5 µg/L (Figure 3.12). 1,1-DCE contamination was noted in well 192 near the former Plating Building Degreaser at 135 µg/L.

Well 163 in the north central portion of the MMB exhibited 1,1-DCE at 153 µg/L while well 160 just upgradient detected 1,1-DCE at 4.2 µg/L (Fig. 3.12).

All compliance point monitoring wells were below site cleanup standards for 1,1-DCE.

#### **3.6.2.9 1,1-Dichloroethane Upper Completion Wells**

1,1-DCA upper completion contamination was again limited to three wells in the ICGFS (Figure 3.13). Well 163 inside the MMB detected 1,1-DCA at 2 µg/L, well 209 at the Abandoned Sump at 3.8 µg/L and well 32 near the Abandoned Fuel Lines at 0.95 µg/L. All were well below the site clean-up level of 810 µg/l (Table 3.2).

#### **3.6.2.10 1,1-Dichloroethane Lower Completion Wells**

Well OW-1 again defined the upgradient limit of 1,1-DCA contamination at 4.7 µg/L. Wells 171 and 32 along with pumping well 271 detected 1,1-DCA up to 6.4 µg/L. The contamination in these wells is associated with historical releases from the Former Abandoned Fuel Lines.

Well 163 located inside the MMB in the former D/95 area provided the highest levels of 1,1-DCA contamination at 2,370 µg/L. This contamination is captured by building footing tile drains (Fig. 3.14).

1, 1-DCA contamination was also present in wells monitoring the Abandoned Sump as evidenced by contamination in wells 209 and 71 at 66.2 and 3.4 µg/L, respectively.

A small isolated area of 1, 1-DCA contamination was found in well 165. The plume from this well migrates southeastwardly toward and into well 235.

1,1-DCA was not detected from wells in the Building 50 area.

All ICGFS compliance point wells met the clean-up standard of 810 µg/L.

#### **3.6.2.11 PCB's Upper Completion Wells**

The only upper completion well to detect PCBs in 2011 was well 192U located in the area of the former plating building degreaser adjacent to Department 26. PCBs were detected at 3.1 in the second semi-annual sampling event.

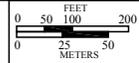
#### **3.6.2.12 PCBs Lower Completion Wells**

Two lower completion monitoring wells detected PCBs in 2011. Well 192L near the former plating building degreaser and Department 26 and the adjacent pumping well 276. Well 192L detected PCBs at 18.7 µg/L in 2011 with pumping well 276 detecting the contaminant up to 88.8 µg/L. As discussed previously, the presence of PCBs in groundwater samples at the KCP is related to the entrainment of PCBs in sediment at the time of sample collection.



**1,1-DCE Concentrations**

- mdl to 7 µg/L
- 7 to 100 µg/L
- 100 to 1,000 µg/L



- In-service monitoring well location
  - In-service water level only
  - In-service interceptor well location
- Contour Interval: 2ft.



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 Drawing Figure 3.11: Indian Creek Flow System Upper Completion  
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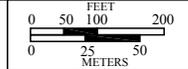


**1,1-DCE Concentrations**

- mdl to 7 µg/L
- 7 to 100 µg/L

- In-service monitoring well location
- In-service water level only
- In-service interceptor well location

Contour Interval: 2ft.



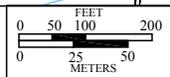
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 Drawing Figure 3.12: Indian Creek Flow System Lower Completion  
 Name: 1,1-DCE Contamination, Fall 2011  
 Date: 02/09/2012



**1,1-DCA Concentrations**

mdl to 810 ug/L



● In-service monitoring well location

● In-service water level only

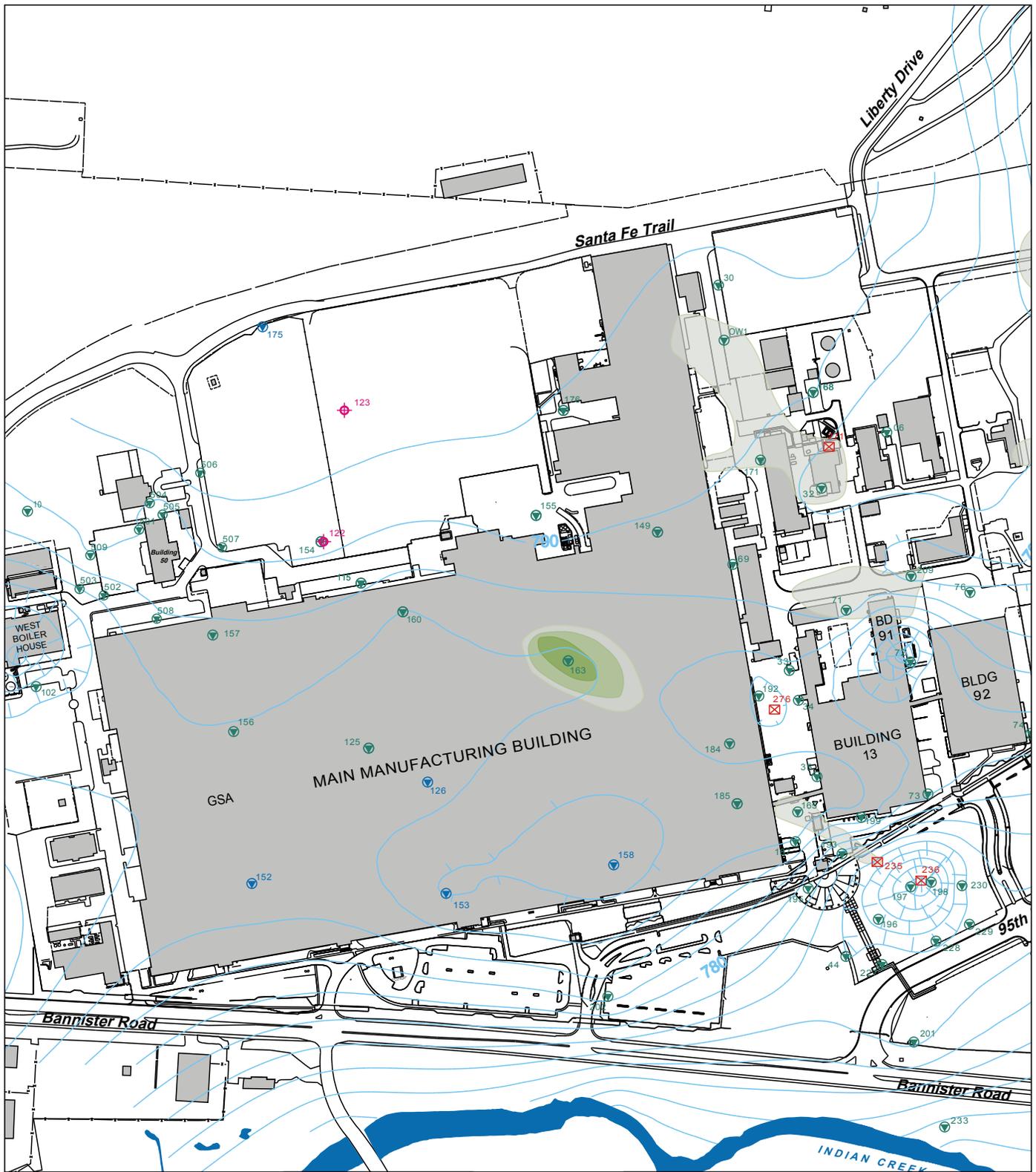
⊠ In-service interceptor well location

Contour Interval: 2ft.



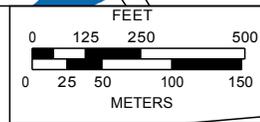
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 Name: Corrective Action Report  
 Drawing Figure 3.13: Indian Creek Flow System Upper Completion  
 Name: 1,1-DCA Contamination, Fall 2011  
 Date: 02/01/2012



**1,1-DCA Concentrations**

- mdl to 810 µg/L
- 800 to 1,000 µg/L
- 1,000 to 10,000 µg/L



- In-service monitoring well location
  - In-service water level only
  - In-service interceptor well location
- Contour Interval: 2ft.



**NNSA**  
National Nuclear Security Administration  
The Kansas City Plant is operated and managed by  
Honeywell Federal Manufacturing & Technologies, LLC, for the NNSA.

Project: 2011 Annual Groundwater  
 Name: Corrective Action Report  
 Drawing Figure 3.14: Indian Creek Flow System Lower Completion  
 Name: 1,1-DCA Contamination, Fall 2011  
 Date: 02/01/2012