

**Table 2-1. Site History****Cave Creek Landfill, Maricopa County**

<b>Date</b>	<b>Event</b>	<b>Significance</b>
1965 to 1984	County operation of the Old CCL on land leased from the BLM; this landfill closed in 1984.	Defines the period when waste was placed in the Old CCL.
1982	County leases New CCL property from the ASLD.	Allows for expansion of landfill operations.
1984 to 1998	County operation of the New CCL; the New CCL ceases accepting waste in 1998.	Defines the period when waste was placed in the New CCL.
October 1982	Installation of the Production Well.	Change in site infrastructure. The Production Well was installed to supply water for fire and dust control purposes.
September 1985	Intermittent groundwater sampling from Production Well begins; TCE detected in September and October 1985 and is not detected again until May 1998.	First indication of TCE contamination underlying the landfill.
1990	County purchases the New CCL property and landfill buffer areas (includes retention areas).	Change in property ownership and expansion of site.
1992	City of Phoenix annexes the site.	Defines period when the property is located within City boundaries.
1993	Installation of MW-1 and MW-2	Initiation of the site groundwater monitoring program.
April 1994	Installation of landfill perimeter soil gas monitoring wells (P Wells)	Initiation of the site landfill gas monitoring program.
September 23, 1994	Restrictive Covenant placed on landfill property at the County's request.	Administrative restriction placed on site use.
September 1995	Installation of supplemental P Wells.	Expansion of the site landfill gas monitoring program in response to elevated methane concentrations in select P Wells.
Circa 1996	Initiation of LFG collection system operation.	Change in site operations.
1997	Southern portion of New CCL lined.	Change in site infrastructure.
December 1997	TCE detected in groundwater from MW-1 at concentrations exceeding the applicable AWQS.	Impetus for Consent Order.
1998	County constructs transfer station in northern portion of the site.	Change in site infrastructure.
August 15, 1999	County enters into Consent Order (CO) with ADEQ to characterize the nature and source of groundwater contamination.	Impetus for additional groundwater monitoring and assessment of regional sources of TCE contamination.
1999	Soil gas samples collected from LFG collection system and select P wells evaluated for chlorinated VOCs.	TCE detected at concentrations typically observed in MSW landfills (2.2 to 2.7 mg/m <sup>3</sup> ); 0.14 mg/m <sup>3</sup> TCE detected in one P well located in the southwestern portion of the site.
January 2000	Water table drops below the screened interval in MW-1.	Collection of water samples from MW-1 no longer possible.
June 2002	Water table drops below the pump intake in MW-2.	Water samples collected from MW-2 with bailer after this date.
November 2004	Characterization of shallow soil gas in existing P wells, the Old CCL (via the installation of ODP-1 through ODP-4) and the New CCL (via the installation of NDP-1 and NDP-2).	TCE, DCE, and toluene detected in select P Wells (predominantly in the vicinity of the Transfer Station/Production Well) and the New CCL at low concentrations.

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Date	Event	Significance
January 20, 2005	Extension of Production Well perforations deeper into the aquifer.	Significant change in Production Well construction.
February 2005	Deepening of MW-1 and MW-2.	Significant change in MW-1 and MW-2 construction.
June 28, 2005	County enters into a CO with ADEQ to characterize and remediate contaminated groundwater.	Requires submittal of a groundwater characterization work plan and a well drilling plan; implementation and documentation of the work plan; notification of offsite impacts, as applicable; submittal of a remedial action plan; discussion of planned corrective measures in a public meeting; implementation of the remedial action plan; and status reporting.
August 25, 2005	County submittal of the <i>Cave Creek Landfill Groundwater Characterization Plan (Work Plan)</i> .	Identifies plan to install MW-3 and presents a CSM.
July 2007	LFG collection system shut down.	Change in site operations.
August 2007	MW-1 becomes obstructed during an attempt to raise the dedicated submersible pump.	No data collected from MW-1 after this date.
December 2007	Installation of MW-3.	Expansion of site groundwater monitoring program.
January 2008	Sampling of landfill vapor monitoring locations.	TCE detected at low concentrations in samples collected from the New CCL; concentrations are slightly higher than observed in 2004/2005.
November 5, 2008	County submittal of the <i>Cave Creek Landfill Groundwater Remedial Action Plan (RAP)</i> .	Documents an approach to address contamination based on a groundwater transport model. Remedial approach includes: operation of the LFG collection system; expansion of the LFG system if necessary; regular monitoring; installation and pumping of a new down-gradient pumping well; and installation of an irrigation system to treat extracted groundwater.
May 11, 2009	County submittal of the <i>Addendum to the Cave Creek Landfill Groundwater Characterization Plan (Addendum)</i> .	Identifies activities supporting downgradient and lateral groundwater contaminant plume definition through the installation of test borings and monitoring wells, vertical characterization of contamination at MW-2 with passive diffusion bag samplers, and adjustment of the pump depth at MW-3.
May - June 2009	Vertical water quality profiling of groundwater at MW-2.	TCE concentrations decrease with depth from the soil-water interface.
June 25, 2009	Pump depths in PW, MW-2 and MW-3 adjusted per the Addendum.	Pumps placed at a consistent depth below the water table for more comparable data.
December 2009 - January 2010	Installation of TSSV-1.	First deep soil vapor monitoring well installed.
January 19, 2010	ADEQ issues a Revised CO.	Requires implementation of the Work Plan and Addendum; the submittal of documentation describing the results of implementation activities; submittal of a Revised RAP; and monthly status reports.

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Date	Event	Significance
October 2010 - May 2011	Installation of MW-4, MW-5, and MW-6.	Expansion of site groundwater monitoring program; definition of the downgradient extent of groundwater impacts.
August 16, 2011	County submittal of <i>Revised Interim Technical Summary Memorandum</i> .	
September 6, 2011	County submittal of the <i>Focused Workplan for Groundwater Characterization Near Old Landfill</i> .	Presents a plan for evaluating whether the Old CCL is a significant source of groundwater contamination via the installation of MW-8.
November 2011 - February 2012	Installation of MW-7 and MW-8.	Expansion of site groundwater monitoring program.
November 2011 - February 2012	Extended Soil Vapor Extraction Pilot Test at TSSV-1.	Elevated concentrations of TCE detected in deep soil gas.
January and March 2012	Select P wells along the eastern perimeter of the New CCL sampled.	Low concentrations of TCE detected.
July 20, 2012	County submittal of the <i>Additional Site Characterization Work Plan</i> .	Concludes that contamination from one or both landfills migrated to depth and resulted in a contaminated soil vapor plume that impacted groundwater at the Site; identifies additional site characterization activities supporting remedial action planning.
October 24, 2012	County submittal of the <i>Soil Vapor Well Planning Evaluation and Technical Approach</i> .	Presents a plan for the installation of additional deep soil vapor monitoring wells.
March- June 2013	Installation of TSSV-2, TSSV-3, and TSSV-4; active and passive sampling of deep soil vapor monitoring wells.	Expansion of the site deep soil vapor monitoring program.
April 28, 2013	County submittal of the <i>2013/2014 Data Compilation Report</i> .	Concludes extent of elevated TCE concentrations in deep soil vapor appear limited to the region underlying the Transfer Station and northern portion of the New Landfill.
May 17, 2013	County submittal of the <i>Soil Vapor Treatment Technology Evaluation</i> .	Identifies granular activated carbon as the air treatment technology for both SVE testing and long-term treatment of extracted vapors.
October 4, 2013	County submittal of <i>Eastern Perimeter Vapor Well Sampling of P-5 and P5-X with Vapor Intrusion Screening Analysis</i> .	Indicates that VOC concentrations in southern portion of Eastern Perimeter are consistent with previous P well data and pose no immediate vapor intrusion treat to nearby residents.
December 18, 2013	County submittal of the <i>Phase 1 Groundwater Modeling Report</i>	Presents groundwater modeling objectives and approach to flow and transport modeling performed in support of remedial action planning.
February 26, 2014	Application for a minor modification to the site air permit for SVE operations.	
July 11, 2014	County submittal of the <i>Phase 2 Groundwater Modeling Report</i>	Documents the development, calibration, and assessment of a three-dimensional numerical groundwater flow model for the site.
July-August 2014	Extended Soil Vapor Extraction Pilot Test at TSSV-2 and TSSV-4.	Highest TCE concentrations observed at TSSV-4 in deep soil vapor.

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<b>Date</b>	<b>Event</b>	<b>Significance</b>
February 2015	County submittal of the <i>Draft Revised Remedial Action Plan</i>	Establishment of remedial actions for site wide cleanup efforts
February-June 2015	Installation of TSSV-5, TSSV-6, and TSSV-7 monitoring wells and SVE-01 and SVE-02 soil vapor extraction wells.	Expansion of site deep soil vapor and groundwater monitoring program and vapor extraction network.
May - August 2015	Full-scale SVE treatment system construction	Commence contaminate soil vapor plume cleanup.
September 2015 - Present	Full-scale SVE operations	Cleanup of contaminated soil vapor plume.
August - September 2015	Draft Revised Remedial Action Plan public comment period and meeting	Provided the public the opportunity to communicate opinions on the remediation effort.

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Notes:

- Addendum = Addendum to the Work Plan
- ADEQ = Arizona Department of Environmental Quality
- ASLD = Arizona State Land Department
- AWQS = Aquifer Water Quality Standard
- BLM = Bureau of Land Management
- CCL = Cave Creek Landfill
- CO = Consent Order
- DCE = Dichloroethene
- LFG = landfill gas
- mg/m<sup>3</sup> = milligrams per cubic meter
- MSW = Municipal Solid Waste
- RAP = Remedial Action Plan
- SVE = soil vapor extraction
- SWICU = Solid Waste Inspection and Compliance Unit
- TCE = Trichloroethene
- Work Plan = CCL Groundwater Characterization Plan