



**US Army Corps  
of Engineers**  
Los Angeles District

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**Little Colorado River at Winslow, Navajo County, Arizona**  
**Flood Risk Management Feasibility Study**

**APPENDIX G**

**Phase I Environmental Site Assessment**

**October 2018**



US Army Corps  
of Engineers

Los Angeles District  
Geotechnical Branch

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## Phase I Environmental Site Assessment for pertinent parts of “Little Colorado River at Winslow” Feasibility Study

Winslow, AZ and Vicinity (Navajo County)



November 2013

**Updated 3-21 and 4-22-2016 in response to LADO Office of Counsel review & alternatives  
modifications; updated 12-8-2017 with additional information on REC site 21.**

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WINSLOW, AZ AND VICINITY (NAVAJO COUNTY)

PHASE I ENVIRONMENTAL SITE ASSESSMENT  
FOR PERTINENT PARTS OF  
“LITTLE COLORADO RIVER AT WINSLOW” FEASIBILITY STUDY

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## TABLE OF CONTENTS

<b>1.0</b>	<b>PURPOSE</b> .....	1
<b>2.0</b>	<b>SCOPE OF WORK</b> .....	1
<b>2.1</b>	<b>Determining Relevance of an Environmental Condition to this Corps Study</b> .....	6
<b>3.0</b>	<b>FINDINGS</b> .....	7
<b>3.1</b>	<b>NPL Sites</b> .....	7
<b>3.2</b>	<b>RCRA Cleanup Sites</b> .....	7
<b>3.3</b>	<b>Solid Waste Landfills</b> .....	8
<b>3.4</b>	<b>LUSTs</b> .....	8
<b>3.4.1</b>	<b>Whiting Station # 23</b> .....	8
<b>3.4.2</b>	<b>Phil Bruchman Trading</b> .....	9
<b>3.4.3</b>	<b>Duke City Lumber Mill Site</b> .....	10
<b>3.4.4</b>	<b>Unnamed LUST site</b> .....	14
<b>3.4.5</b>	<b>Case-closed LUST sites</b> .....	14
<b>3.4.6</b>	<b>Orphan LUST site</b> .....	15
<b>3.5</b>	<b>USTs</b> .....	18
<b>3.6</b>	<b>ASTs</b> .....	20
<b>3.7</b>	<b>Hazardous Materials Incident Reports</b> .....	22
<b>3.8</b>	<b>Former Railroad Alignment</b> .....	23
<b>3.9</b>	<b>Vehicle Salvage Site</b> .....	23
<b>3.10</b>	<b>Buried Vehicles</b> .....	26
<b>3.11</b>	<b>Wastewater Treatment Plants</b> .....	30
<b>3.12</b>	<b>Potential Levee Fill and Drain Material Borrow Sites</b> .....	30
<b>3.13</b>	<b>Potential Disposal Locations for Export Earthen Materials</b> .....	31
<b>4.0</b>	<b>CONCLUSIONS</b> .....	31
<b>5.0</b>	<b>RECOMMENDATIONS</b> .....	35
<b>6.0</b>	<b>COSTS</b> .....	36
<b>7.0</b>	<b>REFERENCES</b> .....	37

Units of measure abbreviations used in this report:

ft = feet  
mi = mile(s)  
sq mi = square mile(s)

## 1.0 PURPOSE

This is a Phase I Environmental Site Assessment (ESA) to identify and inform the joint U.S. Army Corps of Engineers (Corps) and Navajo County ‘Little Colorado River at Winslow’ feasibility study team of any RECs (Recognized Environmental Conditions) that may impact conceptual levee improvements currently under consideration for Winslow Levee, or impact a short adjoining length of Rudy Wash Diversion Levee (RWDL), or areas where some existing residential structures might be elevated to achieve flood damage risk reduction. The existing Levees and conceptual levee improvement areas are shown on Figure 1. The generalized area where some existing residential structures may be elevated to avoid flood damage is shown on Figure 2, but recognize that much of the structure elevation area indicated on Figure 2 has no development, and no structures.

## 2.0 SCOPE OF WORK

This environmental site assessment was performed by the Corps Geology and Investigations Section, Los Angeles, a group of geologists that supports the planning, design, and cost determination efforts by other Corps technical branches through various forms of investigation, observation, analysis, and reporting, on an as-needed basis. It is important to note that no Phase I ESA has been performed for the entire Little Colorado River at Winslow feasibility study area, which is a much larger tract of land, encompassing 49 sq mi (please refer to the Planning Division Main Feasibility Report of this study for a map of the complete feasibility study area). The Corps conducted this Phase I ESA in 2013 for conditions that might affect the *maximum potential footprint of the study*, i.e., sites of potential Levee demolition and rebuild, sites of likely earthen materials “borrow” or “disposal” in the Little Colorado River floodplain and adjoining lands, the ‘non-structural measures’ footprint, and related easements. The work overall will generate an excess of uncontaminated soil materials (river alluvium) but some mining of fines and gravels along the existing Levee perimeter and nearby is anticipated to be done during construction to augment the fill properties of material used for a new levee of larger size. This maximum footprint can be understood by reviewing the maps shown as Figures 1 and 2. If study objectives or footprint change in the future, these Phase I ESA findings will be reassessed and the report may be updated, as necessary. ***One such update was done in March 2016, as the potential maximum footprint of the study had increased. Data were reviewed again to determine potential overlap/conflict between known contaminated sites and feasibility study measures; updated maps were utilized. Results have been incorporated into text and figures, below. A review for any known conditions that may potentially impact the “O’Haco Northwest” potential borrow site was conducted.***

The data review and assessment and report preparation were conducted to the requirements of ASTM E 1527 (2013 version), by one individual, a geologist licensed in the State of California, with 17 years of experience in Phase I ESAs.

The regulatory database search that was conducted by the Corps included these public-accessible, internet-posted databases, which were searched on 23 October 2013:

- EPA (US Environmental Protection Agency) National Priorities List (NPL) of Superfund sites database (historical and current data to 2013);

- EPA RCRA (Resource Recovery and Conservation Act) cleanup sites database (historical and current data to 2013);
- ADEQ (Arizona Department of Environmental Quality) LUST (leaking underground storage tanks) database (historical and current data to 2013);
- ADEQ Route 66 brownfields sites status database (historical data through February 2010 only);
- ADEQ DEUR (declaration of environmental use restriction) and VEMUR sites (voluntary environmental mitigation - use restriction) database (historical and current data to 2013);
- ADEQ UST (underground storage tank) database (historical and current data to 2013, which also includes data on completed, documented UST tank pulls ('tank closure'));
- ADEQ hazardous materials incident database (historical information through 2001 only).

In addition to searching the above databases, and screening them for sites with importance relative to the objectives of this feasibility study, these additional actions were taken:

- drive-by windshield survey was conducted of the area of interest in a search for any visible indications of RECs not listed in regulatory databases, and to obtain additional information on known and potentially pertinent REC properties;
- historical and current aerial photographs were reviewed;
- a City of Winslow map of "active" LUSTs dated December 2011 was reviewed and compared to existing databases;
- internet-posted information was searched for locations of landfills and waste water treatment plants, for historical background information on former lumber milling locations in Winslow, and to discern the details regarding a reported VEMUR site at or near the La Posada hotel in Winslow.

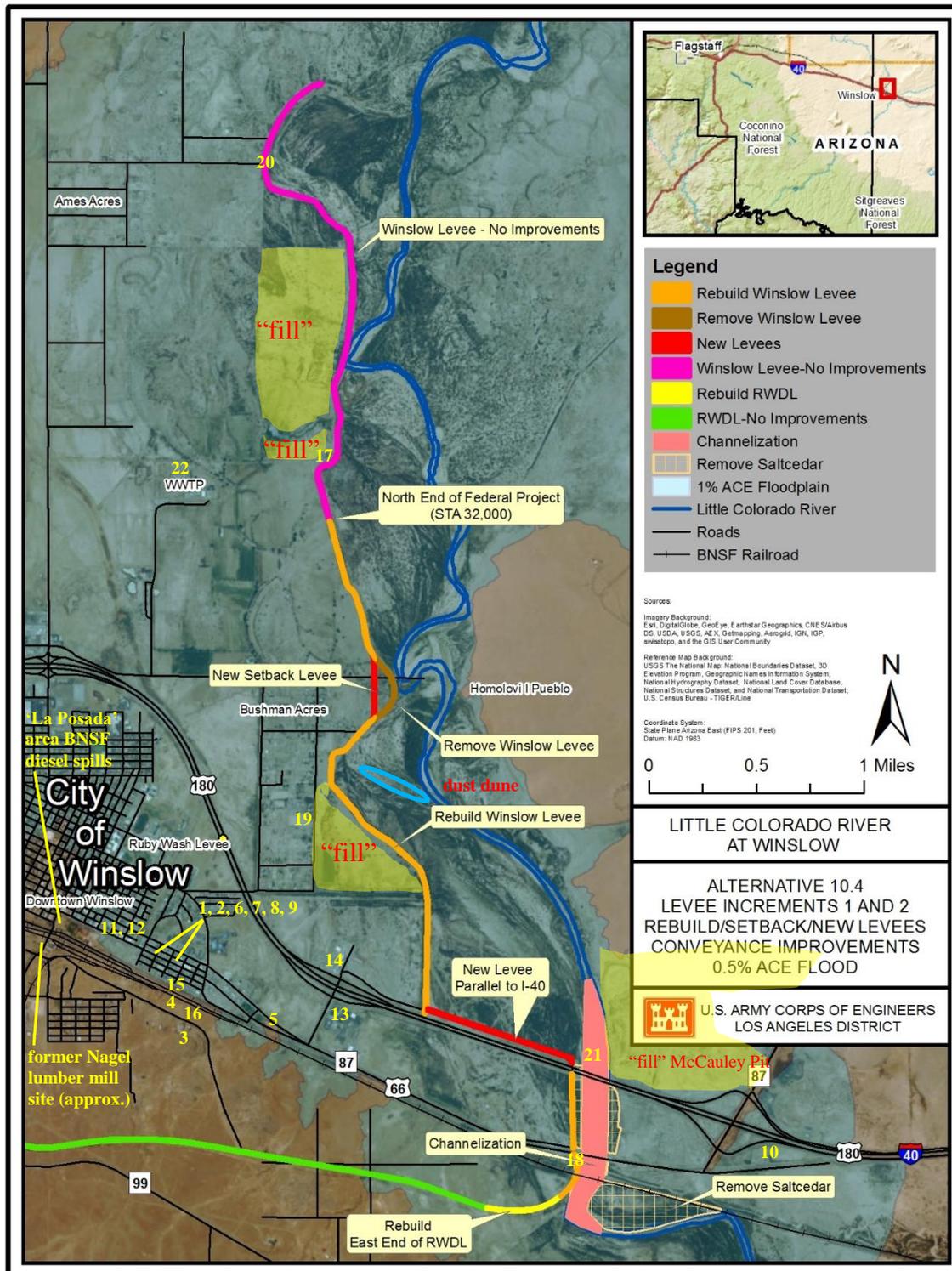
Activities that can be a part of a Phase I ESA, but that were not conducted here include:

- resident interviews;
- historical telephone directory searches;
- Sanborn Fire Insurance maps review.

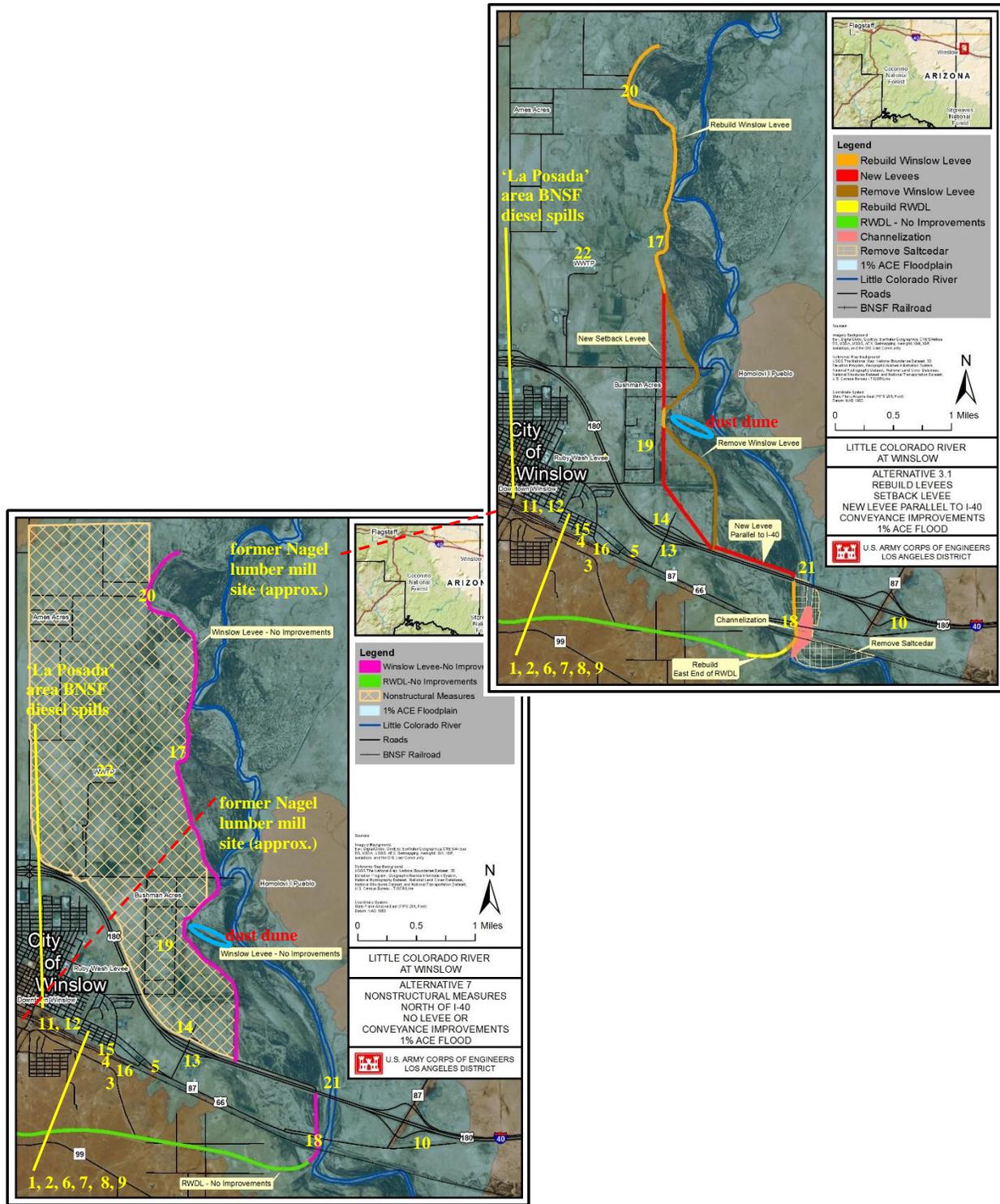
The sites that were assessed as potential RECs are in the following list. Their locations are indicated by site number or name. All are shown on Figures 1 and 2. Discussion of each site follows in text and tables.

1. Whiting Station #23 hydrocarbon fuel LUST, not remediated.
2. Phil Bruchman Trading hydrocarbon fuel LUST, not remediated.
3. Duke City Lumber mill LUSTs, under remediation since 1993.
4. Unnamed LUST site, no information.
5. Three remediated hydrocarbon fuel LUST properties, combined into City park (Route 66 Chevron, Texaco, Winslow Mini Mart).
6. Remediated hydrocarbon fuel LUST (Cafe Service Station).
7. Remediated hydrocarbon fuel LUST (Winslow Shell, since redeveloped as a Sonic Drive In).
8. Remediated hydrocarbon fuel LUST (Stoney's Garage).
9. Remediated hydrocarbon fuel LUST (Cafe Chevrolet).

10. Remediated LUST (Minnetonka Trading Post).
11. Remediated hydrocarbon fuel LUST, current VEMUR, (Navajo County, Winslow Complex).
12. Remediated hydrocarbon fuel LUST (KTrans Express).
13. Flying J trucking plaza / Freddie's; 2 sets of hydrocarbon fuel USTs under different ownership, 2 diesel fuel spills.
14. Winslow Fuel, likely hydrocarbon fuel USTs.
15. McHood Oil, hydrocarbon fuel ASTs and diesel fuel spill.
16. AST (rail tank car).
17. AST, apparently empty.
18. **REC** Former railroad track alignment across Winslow Levee.
19. Kachina Auto Salvage Yard, over 500 salvage vehicles.
20. **REC** Buried automobiles in Winslow Levee.
21. **REC** Site of former buried SUV-type vehicle in Little Colorado River, within the footprint of one of the excavation measures under consideration (vehicle has been removed).
22. Winslow wastewater treatment plant.



**Figure 1** — This Phase I ESA identifies potential RECs (numbered/named sites) that may impact the shown existing levee and conceptual levee improvements (purple, red, brown, yellow, orange lines, pink polygon, yellow hachured area), and potential excess earth materials disposal sites (marked “fill” and shaded yellow), as well as additional conceptual impact areas shown on Figure 2. See main feasibility report for full alternatives array.



**Figure 2**—This Phase I ESA identifies potential RECs (numbered/named sites) that may impact conceptual elevation of existing structures (within zone of yellow hatching in lower left map), potential set-back levee footprint (red solid line in upper right-hand map), as well as additional conceptual impact areas shown on Figure 1. Much of the conceptual elevation of existing structures zone has no development and most existing structures are not densely concentrated. See main feasibility report for full alternatives array.

## 2.1 Determining Relevance of an Environmental Condition to this Corps Study

The Phase I ESA evaluator's data search and screening process had the objective of either eliminating sites with environmental wastes issues from further consideration or their classification as a Recognized Environmental Conditions (RECs), a Controlled Recognized Environmental Conditions (CRECs), or an Historical Recognized Environmental Conditions (HRECs), with regard to the conceptual work at or near the Levees and the potential structure elevation area.

Sites with known or suspected environmental wastes were screened for relevance as RECs, considering:

- the specific environmental waste or contaminant / commodity involved, and its ability to migrate, given the transport media available;
- physical proximity to the Levees, potential borrow areas, potential work zones, and the areas where existing structures may be elevated;
- impact of groundwater by the environmental waste, known or suspected;
- location of the environmental waste relative to known or expected groundwater gradient.

Searches were made for any regulatory database listings and any internet news article reports on NPL (National Priorities List) "Superfund" sites, and RCRA cleanup sites anywhere in Winslow, AZ. Had any been identified, they subsequently would have been evaluated with regard for their potential to impact the area of interest, applying criteria listed above. The same process was applied to all encountered Hazardous Materials Incident Reports. Most of the land in Figures 1 and 2 is outside of City of Winslow city limits, but does have a Winslow, AZ, mailing address, so the search parameter applied, 'sites "in Winslow"', was sufficient to detect any documented RECs in this zone.

The search was made for listings of any solid waste landfill anywhere in Winslow. Had any been found, its potential as an REC would have been further assessed based on proximity to the area of interest, history of violations, if any, impact to groundwater, if any (and, subsequently, groundwater gradient).

The database search for USTs (this is reference to non-leaking USTs) included the entire area shown on Figures 1 and 2, but the USTs were not considered relevant to the area of interest unless they are on, under or adjacent to the Levees and potential earth moving zones (including potential fill borrow zones), or adjacent the existing structures that may be elevated (Figure 2). Those closest to the area of interest are discussed in the following report.

The search for ASTs included all other mentioned data and map sources (no AST-specific regulatory database was found for this area). ASTs were not considered relevant to the area of interest unless on or adjacent to the Levees and potential earth moving zones (including potential fill borrow zones), or adjacent the existing structures that may be elevated (Figure 2). Those closest to the area of interest are discussed in the following report. The physical site survey for additional ASTs was focused on the Levee and adjoining lands, although several were noted while performing the survey of other types of potential RECs in farther outlying areas.

The database search for LUSTs included the entire area shown on Figures 1 and 2. Those LUSTs occurring more than 1 mi away from the area of interest were screened out as a first cut, and are not discussed in this report. Those occurring 1 mi away or less were given additional consideration. Site conditions used to further consider each LUST site as a REC or non-REC with regard to the area of interest included:

- specific environmental waste present and fate and transport of that waste;
- soil impact only vs. soil plus groundwater impact;
- anticipated groundwater flow direction;
- status (non-characterized, characterized, remediated, or not remediated);
- 'case-closed' status vs. 'active' status;
- presence or absence of free-floating product on groundwater;
- complexity of remediation;
- past site use.

To document and maintain the record of the evaluation process and results, those LUSTs a mile or less from the area of interest that were eliminated through applying the above criteria, have been tabulated in this report. Those with perceived or potential greater relevance to this study receive additional discussion in the following text.

The search was made for any wastewater treatment plant anywhere in Winslow. Potential as an REC was then further assessed based on proximity to the area of interest, history of violations, if any, impact to groundwater, if any (and, subsequently, groundwater gradient).

The drive-by survey focused on Levees, adjoining lands, potential work sites, and included a search for visual indications of REC issues not recorded in the databases. The survey also served to allow further assessment of known sites with potential to be an REC, relative to the area of interest.

### **3.0 FINDINGS**

Pertinent sites / potential RECs discussed in this section are shown on Figures 1 and 2.

#### **3.1 NPL Sites**

The EPA's Superfund site list / National Priorities List indicates no NPL sites in Winslow, AZ, as of 23 October 2013.

#### **3.2 RCRA Cleanup Sites**

The EPA's RCRA (Resource Conservation and Recovery Act) cleanup site list indicates no RCRA cleanup sites in Winslow, AZ, as of 23 October 2013. A RCRA cleanup site is a business or former business that used, stored, or produced RCRA-monitored commodities, and that had issues with of some type of RCRA-regulated substance.

### 3.3 Solid Waste Landfills

A search was made in telephone directories and on internet databases to determine if a SWL (solid waste landfill) exists in Winslow. None was found. Reference was encountered only to a waste transfer station in town and a hazardous materials / waste bulking center on the far west side of town, many miles from the Levees and other areas of interest.

### 3.4 LUSTs

Evaluation of databases for LUSTs within a mile of the area of interest revealed 15 sites that required and received additional Phase-I-level assessment, including:

- four LUST sites that have some remaining potential to be classified as RECs in the context of this study, that are not remediated as of late 2013, and for which some information gaps exist;
- 10 case-closed, remediated LUST sites within a mile of the Winslow Levee or its potential realignments, which are not RECs with regard to this study;
- one “orphan” LUST site.

The LUST sites with some remaining potential to be classified as RECs in the context of this study are detailed below.

#### 3.4.1 Whiting Station # 23

The closest LUST property to the potential realignment of the Winslow Levee is ‘Whiting Station # 23’, at 1402 E. 2<sup>nd</sup> St. (site #1 on Figures 1 and 2; see also Figure 3) (facility ID 0-005653). This site is 0.6+ mi west of a potential levee realignment and 1 mi west from existing Winslow Levee. It also is upgradient of the Levee, with regard to anticipated groundwater flow direction. In June 1994, four separate UST leaks or releases were identified at the property. Permanent tank closures were completed for 9 of the 10 USTs on the site in August 1994, when ownership was ascribed to ‘Sunshine Western Trucking, Inc.’. The tenth UST was pulled and permanent closure completed in June 2002, an action ascribed to a different ownership, that of ‘Sunwest Express, Inc.’ As of early 2010, the groundwater contaminant plume was undefined and site characterization was underway, utilizing a site characterization plan approved by ADEQ in May 2006. By 2013, the State recognized that soil and groundwater contamination are present at levels exceeding one or more standards and that remediation is necessary. Identification of specific contaminant(s) and the contaminant plume map are not among the databases accessible to date (ADEQ LUST database, ADEQ UST database, and ADEQ Route 66 brownfields status list). That information continues to be sought by the Corps. The Corps conducted a drive by examination of the site in September 2013. The photograph, Figure 3, which is from Google Earth and dated June 2012, is representative of the late 2013 site conditions seen by the Corps: an active trucking / vehicle related business with no obvious signs of a remediation process underway.



**Figure 3**— Whiting Station #23 leaking UST site, not remediated, looking northwest. Photograph from Google Earth (June 2012).

### **3.4.2 Phil Bruchman Trading**

The ‘Phil Bruchman Trading’ LUST site, at 1407 E. 2<sup>nd</sup> St. (site #2 on Figures 1 and 2; see also Figure 4) (facility ID 0-006489), is another LUST site that is not yet remediated. It is 0.6+ mi west of potential levee realignment, 0.9 mi west from existing Winslow Levee, and upgradient of the Levee with regard to anticipated groundwater flow direction. Sometime prior to 2007 (probably in 1989), groundwater contamination that included free-floating product was known, and in November 2007 an additional release of the same type (impacting groundwater, involving free-floating product) was discovered. As of early 2010, site characterization was underway, utilizing a site characterization plan approved by ADEQ in November 2007. By 2013, the State recognized that soil and groundwater contamination is present at levels exceeding one or more standards and that remediation is necessary. Identification of specific contaminant(s) and the contaminant plume map are not among the databases accessible to date (ADEQ LUST database, ADEQ UST database, and ADEQ Route 66 brownfields status list). That information continues to be sought by the Corps. The Corps conducted a drive by examination of the site in September 2013. Figure 4, which is from Google Earth and dated June 2012, is representative of the late 2013 site conditions observed by the Corps: a possibly active business site, named ‘Four Feathers Trading Post’, with no obvious signs of a remediation process underway. Permanent tank removals took place on the property in March 1989 and October 2007, which explains the two different dates of discoveries of LUSTs, one after the 2007 tank pull, and another discovery earlier, probably associated with the previous tank pull.



**Figure 4** — Phil Bruchman Trading leaking UST site, not remediated, looking south. Photograph from Google Earth (June 2012).

### 3.4.3 Duke City Lumber Mill Site

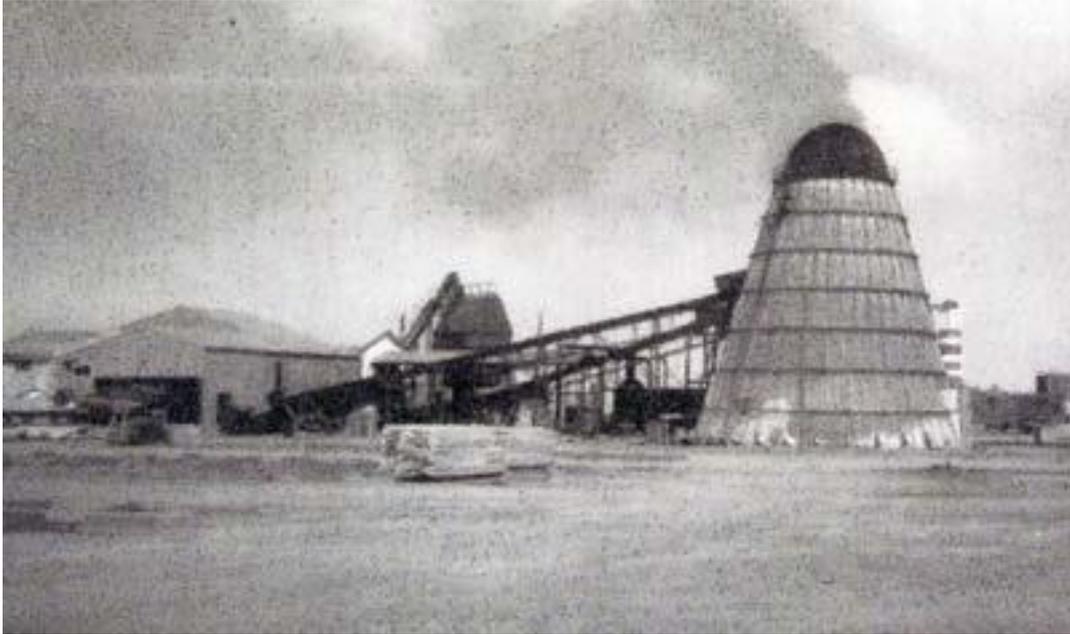
‘Duke City Lumber’ at 901 Old Clear Creek Rd. is an inactive sawmill site (site #3 on Figures 1 and 2, see also Figure 5) (facility ID 0-001812). The works opened in 1950 as the Gallagher Mill to process lumber from virgin Ponderosa Pine forests south of town, and utilize adjoining rail transportation for efficient shipping of lumber products. It was sold to the Duke City Lumber Company (Figure 6) in 1958, and again changed hands in 1991, when purchased by Precision Pine and Timber. The mill closed in 1999<sup>1</sup> (Roth, 2011; Lucas, 2011, Arizona Journal, 2011). An extensive waste pile of woody debris, including stripped tree bark, remains on the east end of the property as of late 2013, adjacent Old Clear Creek Rd. (Figure 8). Navajo County parcel records of 2013 list the remaining largest mill building as a separate property from the rest of the site. The LUST site address of 901 Old Clear Creek Rd. surrounds this mill building on the south, east, and west sides. This perceived ‘main’ mill building is the large, grey, sheet-metal-sided structure that dominates the view in Figure 5, and which also is visible on the left side of Figure 6. It is a separate parcel, bearing a different street address (969 Old Clear Creek Rd.), and is under separate ownership from 901 Old Clear Creek Rd. A City of Winslow 2011 map of active LUST sites suggests the problematic USTs are south and west of the aforementioned mill building, as indicated on Figures 5 and 8. An aerial photograph of 1997 shows what appear to be numerous excavation pits and trenches southwest of the mill building, suggesting at least some of the LUSTs were (and possibly are) at places indicated on Figure 8.

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<sup>1</sup> Winslow hosted a second sawmill, called the Nagel Mill, from 1942 to 1980 (Lucas, 2011), which was located about  $\frac{3}{4}$  mi farther west (Arizona Journal, 2011); see approximated location on Figure 1.



**Figure 5** — Duke City Lumber leaking UST site, which has been under remediation for the past 20 years, looking southeast. Photograph from Google Earth (June 2012).



**Figure 6** — The Duke City Lumber mill in operation, undated. Photo from Roth (2011).



**Figure 7** — Woody mill waste piled east of the Duke City Lumber site, looking northwest. Note mill (arrow). Photograph from Google Earth (June 2012).



**Figure 8** — Lumber mill and LUST sites, Old Clear Creek Rd. Rd. LUSTs approximated by red squares. See parcel boundaries, Figure 9. Photograph from Google Earth (June 2012).

This site is 0.9 mi west of potential levee realignments and slightly more than 1 mi distant from existing Winslow Levee, and is upgradient of the Levee, with regard to anticipated groundwater flow direction. The mill has four recorded individual UST-related releases, all of which were recognized beginning twenty years ago, in October 1993. At least five USTs were present on the property. The records list only three of them as having been removed, all in November 1993. Remediation began nearly 20 years ago, in November 1993, and all the releases still were undergoing remediation as of October 2013 according to the ADEQ LUST database listing. Each of the releases has a defined groundwater contaminant plume, free-floating product, and is undergoing active remediation comprised of active skimmers, oxygen release compounds, and enhanced bioremediation. The Corps conducted a drive by examination of the site in October 2011 and again in September 2013. The photographs, Figures 5 and 7, which are from Google Earth and dated June 2012, are representative of the site conditions seen by the Corps: an inactive, partly demolished industrial site with some signs of gatekeeping, and possibly remediation, underway.

#### **3.4.4 Unnamed LUST site**

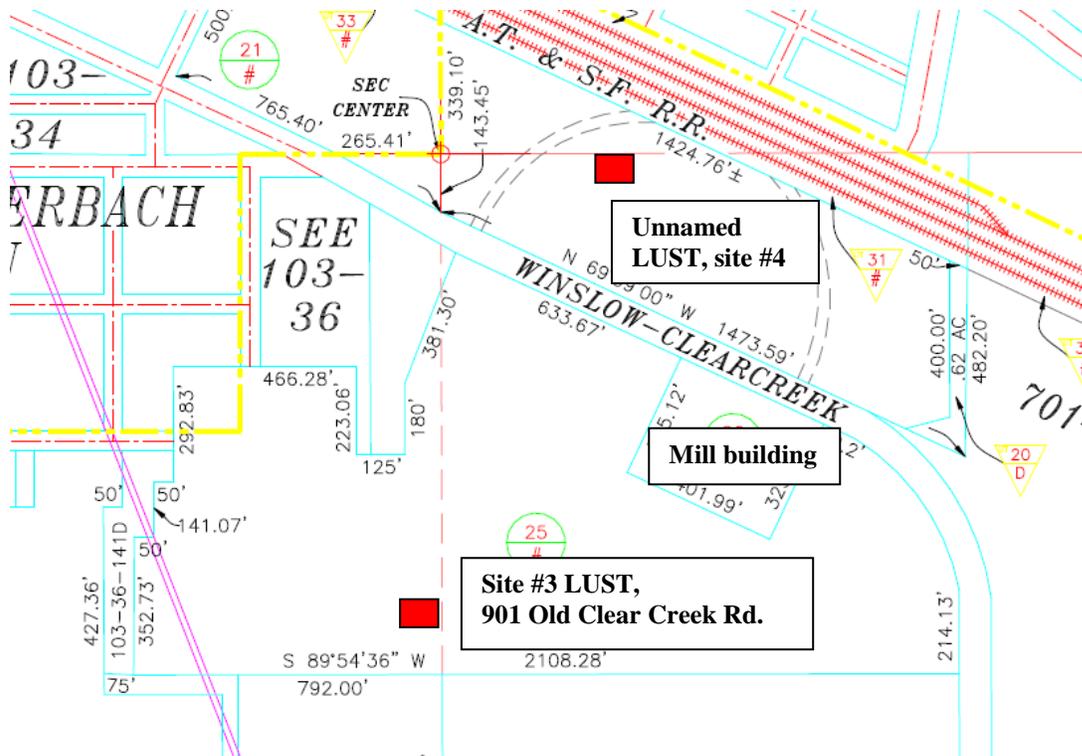
An unnamed LUST site (site #4 on Figures 1 and 2; see also Figures 8, 9, and 10) on the opposite side of Old Clear Creek Rd. from the former Duke City Lumber mill came to the attention of the Phase I ESA evaluator only because it is shown on a December 2011 City of Winslow map of “active” (presumably “not fully remediated”) LUST sites. No other information suggesting the presence of a LUST at this property has been found, and the site is not in the ADEQ LUST database, or in any other regulatory records or sources of information. According to Navajo County parcel records of late 2013 (Figure 9), the site has no street address and its owner is different from both the owner of the former lumber mill building (969 Old Clear Creek Rd.), and the owner of the Duke City Lumber LUST site (901 Old Clear Creek Rd.). The site indicated as the LUST is 1 mi from conceptual Winslow Levee realignments, and was vacant land as of September 2013, when the Corps drove by to examine the area. There were no visible signs of a tank, a release, an investigation, or remediation, at that time. That it is in the center of a former semi-circular railroad spur suggests it was an industrial or railroad site at some point in the past. That former use could not be determined with available sources of information. Records indicating locations of former rail activities sites were searched.

#### **3.4.5 Case-closed LUST sites**

LUST sites that are already remediated to the point of regulatory closure, and that also are within one mile of the Winslow Levee or its potential realignment footprint, include the 10 locations listed in Table 1, below. Of those sites, the three closest to the area under study were three former fueling stations in very close proximity to each other, on the same city block, all about 0.5 mi west of potential levee realignment. All impacted soil, not groundwater. The composited site that once hosted those three fueling stations has been redeveloped as a roadside City park (Figure 11).

### 3.4.6 Orphan LUST site

‘Orphan sites’ are potential REC’s that have no valid address or other usable location information associated with them, and so cannot be plotted on a map with any assurance. There is one orphan LUST site in Winslow: ‘Thriftway 3216’ in Winslow (facility ID 0-005041), which has been case-closed status since 2006. It was on State Route 87, and affiliated with the former Borderland Trading Post, another business for which no address can be determined. The two USTs on the property, owned by Giant Four Corners, Inc., were removed and permanent tank closure was attained in December 2004 (ADEQ UST database). Almost certainly, petroleum fuels were involved. The site may be near, or far, from Winslow Levee. No assessment can be made.



**Figure 9** — Navajo County property plat map (2013) showing Duke City Lumber mill and unnamed LUST sites, and generalized tank locations, Old Clear Creek Rd.



**Figure 10** — Site #4, unnamed LUST site (bare ground at arrow) indicated on City of Winslow map as active LUST site, on north side of Old Clear Creek Rd., View to the northeast. See also figs. 8, 9. Photograph from Google Earth (June 2012).

<b>Table 1</b> -- Summary of remediated, ‘case-closed’ LUST sites within 1 mile of Winslow Levee or its potential realignments. <i>Note: “RBCA” = “risk-based corrective action”</i>			
<b>Facility, ID #</b>	<b>Site issues, conditions</b>	<b>Cleanup history</b>	<b>Location</b>
Route 66 Chevron (00-00849), 1979 Old Hwy 66, Winslow. Site #5, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not noted in records obtained to date. Redeveloped along with 2 adjoining fueling station sites as a City park by mid 2012 or before (see Figure 11). Permanent tank closure in October 1999 (4 USTs).	Some type of petroleum fuel leaks discovered between Apr. 1996 to Dec. 1997, cases closed in Aug. 2008. 4 leaks / USTs involved.	0.5 mi W. of potential levee realignment, 0.7 mi W. of existing Levee.
Texaco Certified Tire (00-002850) 1927 Old Hwy 66, Winslow. Site #5, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not noted in records obtained to date. Redeveloped along with 2 adjoining fueling station sites as a City park by mid 2012 or before (see Figure 11). Permanent tank closure in October 1999 (4 USTs).	Some type of petroleum fuel leak discovered in Jul. 1994, case closed in April 2000. 1 leak / UST involved.	0.5+ mi W. of potential levee realignment, 0.7+ mi W. of Levee.
Winslow Mini Mart (00-002220) 1900 ½ Old Hwy 66, Winslow. Site #5, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not noted in records obtained to date. Redeveloped along with 2 adjoining fueling station sites as a City park by mid 2012 or before (see Figure 11). Permanent tank closure in Nov. 1999 (5 USTs); 5 tank removals specifically noted in the record.	Some type of petroleum fuel leaks discovered in Dec. 1999, case closed in April 2008. 4 leaks / USTs involved.	0.5+ mi W. of potential levee realignment, 0.7+ mi W. of Levee.

**Table 1** -- Summary of remediated, ‘case-closed’ LUST sites within 1 mile of Winslow Levee or its potential realignments. *Note: “RBCA” = “risk-based corrective action”*

Facility, ID #	Site issues, conditions	Cleanup history	Location
Cafe Service Station (0-009842), 1313 E. 2nd St., Winslow. Site #6, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not in records obtained to date. Permanent tank closure in June 2002 (2 USTs).	Some type of petroleum fuel leak discovered in Jul. 2002, case closed in Feb. 2003. 1 leak / UST involved.	0.6 mi W. of potential levee realignment, 0.9 mi W. of existing Levee.
Winslow Shell (0-004500), 1520 E. 3 <sup>rd</sup> St., Winslow. Site #7, Figures 1 and 2	Impacted soil and groundwater. Remediated because AWQS were exceeded by soil and / or groundwater. <b>Case closed.</b> Specific contaminant(s), plume map, not in records obtained to date. Permanent tank closure in Jul. 1999 (5 USTs). Site has been redeveloped as a Sonic Drive In by 2013.	Some type of petroleum fuel leaks discovered in Aug. 1999, case closed in Jun. 2009. 2 leaks / USTs involved.	0.6 mi W. of potential levee realignment, 0.9 mi W. of existing Levee.
Stoney’s Garage (0-009212), 1020 E. 3 <sup>rd</sup> St., Winslow. Site #8, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not in records obtained to date. Site appears to be a closed business in late 2013. Permanent tank closure (1 UST); date not reported.	Some type of petroleum fuel leak discovered in Jul. 2002, case closed in Aug. 2002. 1 leak / UST involved.	0.6+ mi W. of potential levee realignment, 1 mi W. of existing Levee.
Cake Chevrolet (0-009245), 1200 E. 2 <sup>nd</sup> St., Winslow. Site #9, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not in records obtained to date. Site appears to be a closed auto dealership in late 2013. Permanent tank closure in December 1998 (2 USTs).	Some type of petroleum fuel leaks discovered in Jan. 1999, case closed in Aug. 2000. 2 leaks / USTs involved.	0.6+ mi W. of potential levee realignment, 1+ mi W. of existing Levee.
Minnetonka Trading Post (0-000756), 1058 State Hwy 66 (now called State Route 87). Site #10, Figures 1 and 2	Impacted soil and groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s), plume map, not in records obtained to date. Permanent tank closure in Feb. 2005 (1 UST); tank removal specifically noted in the record.	Some type of petroleum fuel leaks discovered in Apr. 2005, case closed in Jul. 2013. 2 leaks / USTs involved.	0.25 mi N. of tributary to LCR; 0.76 mi E. of River within the study area.
Navajo County Winslow Complex (0-000461), 621 E. 3 <sup>rd</sup> St., Winslow. Site #11, Figures 1 and 2	Impacted soil and groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed. Recorded VEMUR.</b> Specific contaminant(s), plume map, not in records obtained to date. Permanent tank closure in Apr. 1993 (2 USTs); tank removal specifically noted in the record.	Some type of petroleum fuel leak discovered in Apr. 1993, case closed in Dec. 1998. 1 leak / UST involved.	0.8+ mi W. of potential levee realignment, 1 ¼ mi W. of existing Levee.
Ktrans Express (0-003944), 420 E. 3 <sup>rd</sup> St., Winslow. Site #12, Figures 1 and 2	Impacted soil, not groundwater. Remediated to RBCA Tier 1 criteria. <b>Case closed.</b> Specific contaminant(s) not in records obtained to date. Permanent tank closure in Feb. 2006 (2 USTs).	Some type of petroleum fuel leaks discovered in Apr. 2006, case closed in Dec. 2006. 3 leaks / USTs involved.	0.9 mi W. of potential levee realignment, 1.3 mi W. of existing Levee.
Information sources consulted to make this table include the ADEQ LUST database, ADEQ UST database, ADEQ Route 66 brownfields status list, ADEQ DEUR database.			



**Figure 11** — Three adjacent, remediated LUST sites on Old Highway 66 at the east end of Winslow (combined “site #5” on Figures 1 and 2). Compositied site is redeveloped as a City roadside park. These are the closest LUST sites of any type to the Winslow Levee. Location is on south side of State Hwy 87, which turns into 3<sup>rd</sup> St. a short distance farther west. LUST property locations approximated by arrows. View to the southeast. Photograph from Google Earth (June 2012).

### 3.5 USTs

USTs (underground storage tanks)<sup>2</sup> that are “active”/ in use or contain fluid contents are of significance to Corps feasibility studies only if they are in or adjacent to potential construction zones. There are no USTs in such close proximity to the area of interest. The closest USTs are the seven active fuel USTs at the Flying J trucking plaza site (site #13 on Figures 1 and 2; see also Figure 12), listed under the ownership name “Pilot Travel Center LLC”, and with the address of the current Flying J business, 400 Transcon Lane. None have a record of leaks.

Three additional active USTs are listed in ADEQ records at Freddie’s #1 Quick Stop (owner Soo Hoo, Inc.), 501 Transcon Lane. None have a record of leaks. Apparently, 501 Transcon Lane has been combined into the same address as the expansive Flying J site at 400 Transcon Lane (site #13 on Figures 1 and 2; see also Figure 12). No separate location with an address of 501 Transcon Lane can be found. Both 501 and 400 Transcon Lane appear to be within the confines of the current Flying J business.

Logic suggests that other petroleum hydrocarbon fuel USTs exist at 1 Transcon Lane, which is the Winslow Fuel business (site #14 on Figures 1 and 2; see also Figure 13), and which has visible gasoline fueling islands and dispensers. No official record of any USTs or UST leaks was found for this property. The site depiction in Figure 13, which is from Google Earth, June 2012, is representative of site conditions observed during the Corps September 2013 drive by examination: an inactive fueling site, with adjoining, active liquor store and restaurant.

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<sup>2</sup> Discussion under this UST heading, as opposed to the LUST heading, implies a non-leaking UST.



**Figure 12** — Site #13 on Figures 1 and 2. 400 Transcon Lane, an active trucking plaza and site of two diesel fuel spills ¼ mi from the potential Winslow Levee improvements. View to the east. Photograph from Google Earth (June 2012).



**Figure 13** — Site #14 on Figures 1 and 2, Winslow Fuel, 1 Transcon Lane, a site with visible fueling islands, and, presumably, petroleum fuel USTs. View to the west. Photograph from Google Earth (June 2012).

All the mentioned USTs are ¼ mile from proposed levee realignment. Their sizes and contents have not been determined, although it seems certain that most, if not all, contain petroleum fuels. No record of USTs, active or inactive, was found for any of the ranches that adjoin Winslow Levee to the west. Those ranches, technically outside of the city of Winslow city limits, nevertheless do bear Winslow, AZ, mailing addresses, and so, the UST database searches that were conducted for this report for “Winslow” locations would have encountered any existing record for USTs there. This supports that no USTs exist there.

### 3.6 ASTs

ASTs (above-ground storage tanks) that are “active”/ in use or contain fluid contents are of significance to Corps feasibility studies only if they are in or adjacent to potential construction zones or if they are known or suspected to have leaks that could migrate into the Corps area of interest.

ASTs were observed at or near two of the aforementioned potential REC locations, each about a mile from proposed levee realignments. Details follow.

McHood Oil Co., at 1115 E. 1<sup>st</sup> St. (site #15 on Figures 1 and 2; see also Figure 14), has eight ASTs that appear to be in use for petroleum products. None have evidence of leaking.



**Figure 14** — Site #15 on Figures 1 and 2, eight ASTs at McHood Oil, 1115 E. 1<sup>st</sup> St., Winslow. View to the south-southwest. Photograph from Google Earth (June 2012).

On Old Clear Creek Rd., on the opposite side of the road from the mill, a railroad tank car (site #16 on Figures 1 and 2; see also Figures 15, 16) is stored on a sharply curved rail siding, apparently on a permanent basis, since the siding track does not connect to any other lines. It was in the same location in June 1997, as per an aerial photograph of that date. The tank car appears to have external plumbing in place for managing some type of fluid content. No

evidence of a leak was seen in September 2013. It may be related to the mill site remediation, but is parked on land that is under different ownership (the rail siding footprint). Per Navajo County ownership plat database of 2013, it is on an unidentified parcel, likely in railroad ownership.

One AST, apparently discarded, was observed at a ‘scrap’ pile outside one of the ranches that adjoin Winslow Levee on the west (site #17 on Figures 1 and 2). This tank is beyond (east of) the eastern truncation of an unpaved ranch road. The AST appears to be empty, since it is tilted, not mounted or secured (it would probably fall over from this position if it had the weight of fluids inside), and shows no outward sign of leakage. It is less than 150 ft from the landside levee toe. Levee construction may be possible without moving it.

No other ASTs were observed at the ranches that adjoin the Levee.

No AST database was encountered for additional information on these containers.

Propane tanks, such as the one seen in front of Winslow Fuel, Figure 13, were not tabulated in this Phase I ESA as “ASTs”. The focus was on ASTs with fluid contents that have potential to impact the area of study, should they leak and/or adjoin the Levee areas. Propane tanks do not meet these criteria. Any propane leak would turn into the gaseous state and dissipate in the air, far from the study area.



**Figure 15** — Site #16, rail tank car AST, opposite the Duke City Lumber site, Old Clear Creek Rd. View to the west. Photograph from Google Earth (June 2012).



**Figure 16** — Another view of site #16, rail tank car AST, opposite the Duke City Lumber site, Old Clear Creek Rd. View to the north. Stationary ASTs of the McHood Oil property (site #15) can be seen on horizon, upper left of frame (large silver tanks). Photograph from Google Earth (June 2012).

### **3.7 Hazardous Materials Incident Reports**

Hazardous materials incident reports typically are related to chemical spills and accidents. Hazardous materials incident reports in Winslow are few in number, but it should be recognized that the database is obsolete and has not been added to since 2001. Two diesel fuel spills have been documented at the Flying J trucking plaza, 400 Transcon Lane (site #13 on Figures 1 and 2; see also Figure 12), which is  $\frac{1}{4}$  mi southwest of a potential levee relocation footprint and 0.3 mi southwest from existing Winslow Levee. In June 1998, 100 gallons of diesel fuel were spilled at the site. A Greenfield Transportation tanker spill in November 1999 resulted in 120 gallons of diesel fuel being released at the site. No other information is available. These incidents occurred upgradient from potential levee improvements, with regard to surface flow.

McHood Oil Co., at 1115 E. 1<sup>st</sup> St. in Winslow (site #15 on Figures 1 and 2; see also Figure 14), experienced a release of an estimated 100 to 300 gallons of diesel fuel in May 1994, in an incident that involved a fire. This site is 1 mi southwest from potential levee improvements, and more than 1 mi from the existing Winslow Levee. No other information is available.

Some consideration was given to whether the La Posada railway and hotel complex might be a soil and groundwater LUST site, based on a brief mention of its VEMUR status in the 2009 ADWR Water Atlas (vol. 2, p. 33), but research revealed it is not, yet it is a hazardous materials release site. In August 2000, BNSF Railway Co. lost 5,000 gallons of diesel fuel from a tank at 301 E. 2<sup>nd</sup> St., Winslow (ADEQ hazardous materials incident 01-015-D). Previously, at the same location, BNSF lost 500 gallons of diesel from a tank (incident 96-018-G), an event that occurred in May 1996. This release site adjoins the west side of the current La Posada rail station / hotel complex at 303 E. 2<sup>nd</sup> St. The ADEQ database lists no LUST or UST site at either

address (301 or 303 E. 2<sup>nd</sup>), which verifies the releases were not from USTs. Releases may have been from rail tank cars or ASTs.

### **3.8 Former Railroad Alignment**

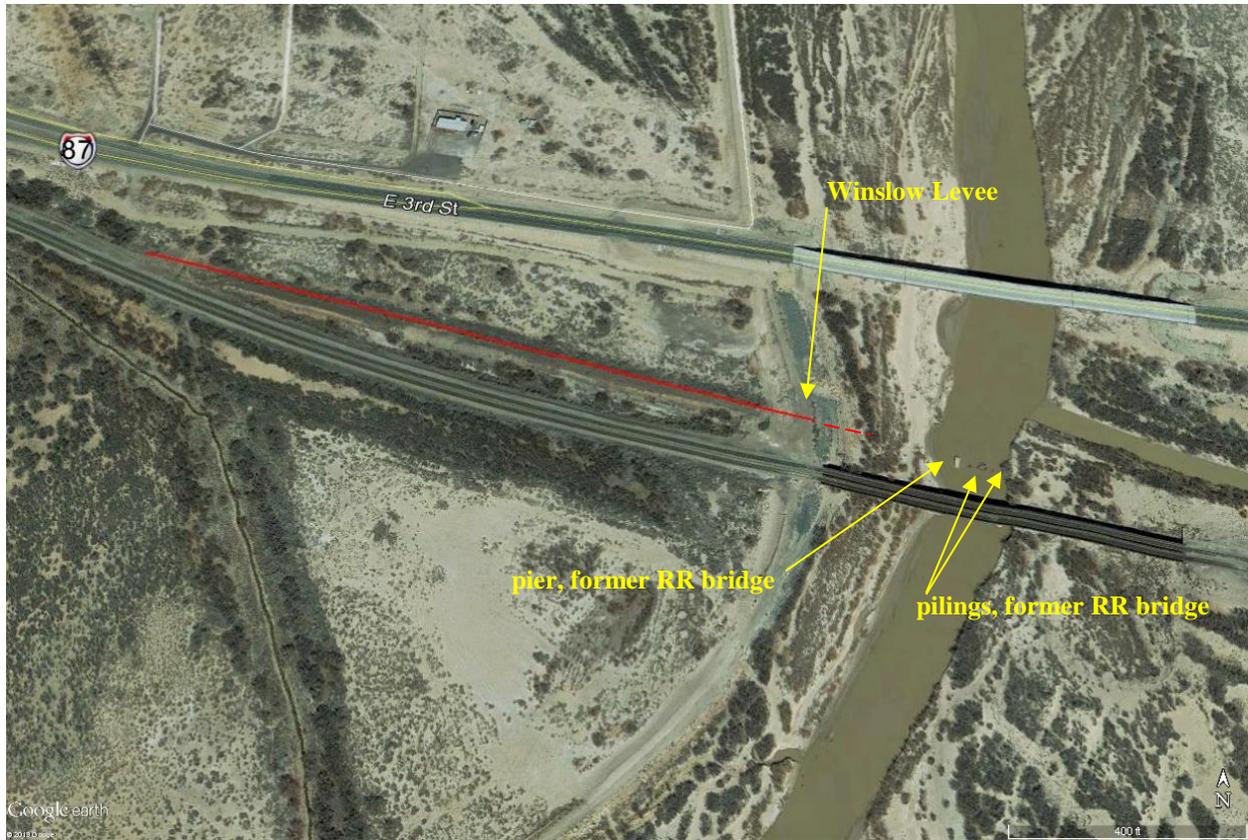
A review of aerial photographs reveals that a former railroad alignment exists over and immediately west of the Winslow Levee at the Little Colorado River. This alignment is north of the current BNSF railway alignment and bridge, and once served a former railroad bridge, since demolished (site #18 on Figures 1 and 2; see also the red line on Figure 17 and the current railway bridge and alignment south of that red line). That old bridge alignment can be discerned by the presence of out-of-service cut-sandstone bridge piers and pilings that cross the Little Colorado River here (see Figures 17, 18). The old bridge and related track and railroad berm were removed sometime prior to June 1997 (neither are present in the June 1997 aerial photograph, the oldest such photograph available).

Environmental site assessments of such former rail alignments typically reveal small quantities of petroleum hydrocarbon leakage in soil beneath former tracks. Such hydrocarbon leakage originates from rail car wheel assemblies, primarily as oil from the journal box. Petroleum contaminated soils along the former track alignment can be the result. Trace amounts of some PCBs also can be found in such locations, likely representing trace chemical components of journal box oil. The depth of penetration into soils beneath the tracks in such instances is usually very shallow and less than 3 ft deep because the means of release is small drips occurring over a long period of time, as multiple trains pass the location. No record of soils testing to verify presence or absence of petroleum contaminated soils along this particular former rail alignment is known.

The current railroad alignment will not be involved in any potential levee work. Any new or relocated levee would be joined to existing railroad grade, berms, and bridge without alteration to the existing railway company structures.

### **3.9 Vehicle Salvage Site**

A vehicle salvage yard exists at 'JRS Kachina Auto Wrecking', 637 French Rd., Winslow (site #19 on Figures 1 and 2; see also Figure 19), and is within 600 ft of the Winslow Levee and 250 ft of conceptual levee realignment. At least 500 salvage vehicles are on the site, based on examination of a 2012 aerial photograph. Aerial photographs as old as June 1997 reveal the site then was in much the same array as now, with hundreds of salvage vehicles present within the same perimeter. The September 2013 Corps drive by of the site shows it is an operating salvage business, but large trees along the roadside prevented determining if many salvage vehicles remain. It is certain that some remain and likely that all remain, since the business is operating and junk vehicles could be seen from the road. The site has no record of USTs, no visible ASTs, no record of leaks or spills, and no record of RCRA violations.



**Figure 17** — REC: Site #18, former railroad alignment (red line) crossing Winslow Levee. Photo: Google Earth June 2012. The old pier noted in Little Colorado River (light-colored rectangle) is 20 ft in the longest dimension.



**Figure 18** — Site #18, remnant sandstone block pier (red arrow) and pilings (blue arrows) of former railroad bridge over Little Colorado River. Current BNSF RR bridge in foreground and current State Route 87 bridge in background. View (and river flow) to the north. Photo: Corps of Engineers, October 2011, at low water.

### 3.10 Buried Vehicles

At least two automobiles are buried in the northern part of Winslow Levee and exposed in the riverside Levee slope, 150 ft south of the intersection of McHood Rd. and the Levee (site # 20 on Figures 1 and 2; see Figure 20). Other metal car body parts nearby within the Levee fill may be agglomerations of loose parts or crushed automobile hulks. Reports concerning how the Levee originally was built (pre-1989) make it clear that junk car bodies were used to construct the Levee. While Navajo County and their contractors made the effort to remove such vehicles from Levee fill as the Levee was being raised and improved in 1989, the scene in Figure 20 demonstrates that at least a few more have to be removed. It is not known whether these vehicles, or any others that still may be concealed in the fill, were drained of fluids prior to their placement as levee fill. Anecdotal evidence concerning the original levee construction suggests it was built under duress, in flood-fight circumstances, which supports that draining these vehicles of fluids probably did not occur.

One operational, SUV-type vehicle was lost and became buried in the Little Colorado River in early September 2013, close to the west riverbank and 200 ft north of the northern (west-bound) Interstate 40 bridge (site #21 on Figures 1 and 2; see also Figure 21). This location is within the river alluvium excavation zone of one of the feasibility Alternatives under consideration (Alternative 10.4), an Alternative that has the most extensive footprint of the various Alternatives that involve river alluvium removal. The vehicle was near and east of a place where new Winslow Levee eventually may be constructed, but not immediately adjacent to that area. This vehicle was fueled and was being driven in the dry riverbed at the time it became stuck in deep, loose, dry sand, so it is certain that it contained oil, gasoline, and antifreeze. Reportedly, a few days after it became stuck, the river rose and flooded it, and logs floating down river broke out all the glass, light assemblies, etc., filling it with sand and mud. Efforts to remove the vehicle in the early fall of 2013 failed, and resulted only in the tow truck snapping tow cables and ultimately becoming stuck in loose sand on the river bank, and requiring extraction by another tow truck. The mass of the lost SUV loaded with wet river alluvium was too much to extract by tow cable pulling. There was no evidence of fuel tank, transmission, or differential ruptures at the time it was observed by the Corps (late September 2013), and no oily plume extending into the river from the vehicle. The vehicle successfully was removed, fully, several years ago by disassembling it into smaller pieces of manageable weight that could be extracted from the enveloping river sediment (Rich Legere, USACE, Planning Division, Phoenix, AZ, personal commun., 6 December 2017). No report is available to the Corps on the means used during that effort to contain fuels, lubricants, and other fluids in the vehicle. As of the time of preparation of the Chief's Report phase of this feasibility study's documentation, Alternative 10.4 will not be the Alternative pursued. Alternative 10.1, the NED plan and the more likely footprint if this flood-control project is constructed in the future, has a smaller footprint, ending upstream of this SUV site, and would not require river sediment extraction in the area where this vehicle formerly was embedded in the Little Colorado River alluvium.



**Figure 19** — Aerial view of auto salvage yard (center of frame, note the hundreds of lined-up salvage vehicles) within 600 ft of Winslow Levee. Site 19 on Figures 1 and 2. Photo: Google Earth June 2012



**Figure 20** — Top and bottom frames. REC: Automobiles used as Winslow Levee fill, south of the intersection of the Levee with McHood Rd. Photo: Corps of Engineers, October 2011. The site was unchanged in September 2013. Site 20 on Figures 1 and 2.



**Figure 21** — Site #21 on Figures 1 and 2. REC: Vehicle lost and buried in the Little Colorado River, September 2013, about 200 ft north of the I-40 west-bound bridge. Photo: Corps of Engineers. The vehicle has been removed. Documentation on whether fluids were released during removal is not available to the Corps.

### 3.11 Wastewater Treatment Plants

Winslow wastewater treatment plant is 2,400 ft west of the Winslow Levee (site #22, Figures 1 and 2). No record was found of any spills or violations associated with it, although reportedly it once was inundated when part of Winslow Levee failed during a storm. Considering the likely groundwater flow direction, effluent from this plant, if discharged into alluvium west of the Levee, would travel about 1-¼ mi underground prior to potentially crossing under the Levee alignment. It is within the zone where some existing structures may be raised in elevation to achieve flood damage risk reduction, but the treatment plant is not adjacent or near any such residences.

Another wastewater treatment plant exists to serve only the Winslow-Apache Prison Complex (GHD, 2013). It is 4.3 mi SW. of the Levee (not shown on any maps in this report due to this large distance). No record was found of any spills or violations associated with it.

### 3.12 Potential Levee Fill and Drain Material Borrow Sites

As is discussed in the Geotechnical Appendix, new fill for levee rebuild or expansion may come from any area along and in close proximity to the existing Levees where such mining would produce acceptable material, not disrupt local drainage, and not interfere with any species protection issues. The anticipated locations of such fill extraction are on the riverside of the Winslow Levee but landward of the active Little Colorado River channel. This zone is anticipated to be able to produce both drain material and levee fill material, but has not yet been tested to verify those gradations. In addition, it is anticipated that additional fines may be needed to blend with the sand and gravel deposited by the Little Colorado River, so as to make a composite levee fill mix that is more amenable to compaction. Wind-deposited accumulations of such fine-grained materials were observed during geologic and geophysical exploration of the area in support of this feasibility study. The anticipated most likely place from which this material would be derived is labeled “dust dune” on Figures 1 and 2. It is a wind-deposited dune, of fine-grained material. It too lacks gradation testing but appears favorable as a source of fines for blending with coarser-grained materials readily available along the Levee. This Phase I ESA looks at the fine-grained material location in terms of potential contamination within the borrow. Figures 1 and 2 are clear indication that this material is not in a location that could be impacted by the RECs and potential RECs discussed in this report.

In the course of the feasibility study, off-site borrow sources also were considered, despite the high cost of hauling levee fill any appreciable distance. The one that remains of interest to this study is the “O’Haco Northwest” materials pit, a privately owned, intermittent producer of earth-fill materials. It is at approximately the address of 7600 N. Park Drive, although it does not have any permanent development. The location is 1.5 mi northwest of the northernmost point on Winslow Levee (see Figures 1 and 2). The O’Haco site is not shown on the feasibility study maps used in the Phase I ESA, as it is outside the perimeter of all of them. This Phase I ESA looks at the location in terms of potential contamination in and around the fill source. The databases searched and described in the beginning of this report show no problematic wastes sites in the vicinity of this O’Haco site.

### 3.13 Potential Disposal Locations for Export Earthen Materials

Overall, any Levee construction to be done is anticipated to produce an excess of earthen materials, which will have to be removed from the site (“disposed of”). This is discussed in detail in the integrated feasibility report. The vast majority of these excess materials will be produced through excavating a wider Little Colorado River channel, beneath one or more existing bridges over the river. The amount and extent of removal varies with the Alternative. The action is one of the of the most essential measures of this feasibility study as it is the only feasible way to lower the water surface profiles at the upstream end of the Levee system. Transportation cost to remove such materials from a site is a major impact on project cost, so nearby locations for disposal are sought. The existing McCauley Pit, labeled on Figure 1, is a materials mine that produces fill products made of Little Colorado River alluvium. It is close to the study area and a logical place for such disposal. Three other potential disposal locations are identified on the landside of Winslow Levee, both open range land. All are shown as “fill” sites on Figure 1. This Phase I ESA looks at the sites in terms of potential contamination.

Figures 1 and 2 are indication that the potential disposal areas on the landside of the Levee are not in locations that could be impacted by the RECs and potential RECs discussed in this report. The McCauley Pit requires additional discussion because it is within 1,700 ft (0.32 mi) of the remediated Minnetonka Trading Post gasoline soil and groundwater impacting LUST site (site no. 10 on Figures 1 and 2). No environmental issues conflicts are anticipated because:

1. The Minnetonka site has been remediated and classified “case-closed” for several years.
2. The Minnetonka site source USTs were removed as part of the remediation, as well as contaminated soil.
3. An ‘injection system’ of remediation of groundwater was employed (likely a system based on injecting bacteria that destroy hydrocarbons into the waste plume).

[Information sources: Gray-Searles, 2011; EPA, 2008.]

4. No material would be removed from the McCauley Pit in relation to this study nor would any groundwater-impacting actions be undertaken in conjunction with work on the Levee.
5. The groundwater gradient is anticipated to be in the opposite direction as the McCauley Pit (to the south, not to the north). The Minnetonka site is south of the McCauley Pit.

## 4.0 CONCLUSIONS

Overview: the state of the study area is favorable in the context potential project-impacting waste releases. No immediate actions are required by the Corps or local sponsor and no realignment of the study footprint is warranted, nor could it be realigned effectively to avoid all RECs. Three RECs exist. A few other releases or potential releases have some potential to be RECs in the context of this study but that risk likely can be eliminated with additional regulatory files search for more site data, primarily to find known limits on groundwater contaminant plume boundaries. It is anticipated the additional data will verify there is no risk to the study area from these additional areas. That data collection and evaluation is not anticipated to be a time-consuming or costly venture. Some part of a former railroad grade base (a small part) will be

excavated in any Levee rebuild scenario. Contaminants are expected, the soils under the former track alignment have not been tested, and could include hazardous wastes (PCBs, likely components of journal box oil) but their concentrations are anticipated to be low. Some junked vehicles will have to be removed from the old northern part of the Levee, if it is included in the TSP (tentatively selected plan). It apparently will not be included. In 2013, an operational vehicle was lost and buried in the Little Colorado River channel within the river alluvium excavation zone of Alternative 10.4, but the vehicle since was removed.

A list of site-specific conclusions follows.

No NPL sites or RCRA cleanup sites exist in Winslow, based on the databases that have been posted on the EPA and ADEQ websites.

No evidence was found suggesting that the community has a solid waste landfill.

Three “active”/ not remediated soil- and groundwater-impacting LUST sites (Whiting Station #23, Phil Bruchman Trading, and Duke City Lumber) received particular consideration in this Phase I ESA as potential RECs. The interest is based on the groundwater impacting characteristics of the sites, coupled with certain unknowns, as explained below. The interest is not based on their soil-impacting characteristics, considering the distances of these sites from this Corps study. Specifically, the sites are of interest because they:

- are not remediated (Whiting, Bruchman) or are not remediated to completion (Duke City Lumber);
- impact groundwater;
- have free-floating product on the groundwater (suggestive both of increased contaminant mobility and concentration);
- are upgradient of the Corps study with regard to anticipated groundwater flow direction;
- do not have contaminant(s) identified in the databases accessible to this point in time;
- do not have contaminant plume map(s) present in the databases accessible to this point in time;
- are moderately close to the area of interest (0.6 to 0.9 mi west from potential levee realignments and a mile or more west from the existing Winslow Levee), and are close enough that it is conceivable, although unlikely, that the groundwater contaminant plumes could have migrated sufficiently to reach the Corps area of interest.

The Duke City Lumber mill site has the additional concerns that remediation has been on-going for 20 years, which is a long time, and involves complex remediation processes, further implying possibly extensive or concentrated contamination. Considering the former use of the site, multiple contaminants may be present and they may include non-petroleum-fuel contaminants, such as chemicals related to the wood processing industry, which may be more of a concern than the petroleum hydrocarbon fuels anticipated to be the sole contaminants at the Whiting and Bruchman sites.

At this point, all three sites are classified as likely non-RECs with regard to this Corps feasibility study, considering the distance their groundwater contaminants plumes would have to travel to

reach the Corps study area. Nevertheless, each has some remaining potential to ultimately be classified as RECs with regard to this study. To resolve this, specific additional information on each site is being sought (identity of contaminant(s), obtain contaminant plume maps), and if the information can be obtained, each site will be reevaluated. It is possible that after access to additional information, all three sites could be dropped from consideration as potential RECs, or they could be elevated to CREC or REC status. Distance and direction that the groundwater contaminant plumes have or have not traveled, and that they may travel, will be major factors in the decision.

An unnamed LUST site is reported to exist 0.9 mi west from levee realignments (site #16, Figures 1 and 2), but its existence cannot be verified and it is not on any regulatory database, leading to the conclusion that it may be an erroneous listing of a LUST location. Its potential relevance to this Corps study, if any, would be determined using the same criteria listed above for the Duke City Lumber site, should any other information on this unnamed site ever be encountered.

Ten remediated LUST sites, all in case-closed status, are within 1 mi of the potential Winslow Levee realignments, with the closest being 0.5+ mi to the west. None are in the zone where existing structures may be elevated for flood risk reduction. The ten sites were tabulated in Table 1 to document their assessment for this ESA. It is concluded that, at such distances, coupled with the fact that they are remediated, all are non RECs with regard to this Corps study, and do not warrant further consideration. A site that has been remediated yet is still very close to or adjacent a potential Corps construction zone would have received more attention in this Phase I ESA, with goals such as verifying that the contaminant plume has not escaped the property perimeter, or, if it has, verifying that it was fully remediated. Such attention is not warranted for these properties.

Documented USTs and ASTs all are sufficiently distant from the Levees and related areas of interest that none represent an REC of any type for this feasibility study (this is in regard to non-leaking tanks). No active USTs or ASTs adjoin the Levees, potential work areas near the Levees, potential borrow areas, or locations where existing structures may be elevated. The closest active USTs are the group of 10 petroleum fuel USTs at a trucking plaza ¼ mi to the west of the Winslow Levee.

Documented hazardous materials incidents (i.e., “spills”) all are sufficiently distant from the Winslow Levee and related areas of interest, including zones where existing structures may be elevated, that none represent an REC of any type for this feasibility study. In the instance of the McHood Oil Co. diesel fuel release at 1115 E. 1<sup>st</sup> St., it is exceedingly unlikely that the spill could have reached the area of interest, based on the distance involved. The fact that the incident was reported and presumably included a response to a fire is indicative that ‘cleanup’ of some manner occurred after the event, further reducing the possibility that migration to the Levee could have occurred. The same general conclusions and reasoning are applied to the two diesel fuel spills at the Flying J trucking plaza, even though it is much closer to the Levee. The fuel quantities released at Flying J were considered when drawing this conclusion. The La Posada site is another hazardous materials incident location (two sizeable diesel fuel releases from non LUST sources) but is not relevant to this Corps study, due to distance (more than a mile).

A former railroad track alignment over the Winslow Levee is presumed to be untested, since the Corps could obtain no information to the contrary, and may contain small quantities of leaked petroleum hydrocarbons in the form of journal box oil, and even related trace PCBs, chemicals that may exist as components of journal box oil. Such occurrence is common enough along former rail track alignments that such release is anticipated to possibly be present here, unless or until proven otherwise through soils testing along the alignment. No such soils testing is planned or anticipated to be done as a part of this feasibility study. The site is considered an REC with regard to the Levee, as long as there is an absence of favorable soil testing.

A vehicle salvage site with over 500 junk vehicles is less than 600 ft from the Levee and less than 250 ft from potential realignment. It is not considered a REC at this time with regard to this study, because the business has no known ‘violations’ or other negative environmental records, including no record of any substance releases, or RCRA infractions, or LUSTS, and it has no known USTs or ASTs. The current planning concepts for this area do not include elevating any of the nearby residences or other nearby work.

Buried automobiles used as Winslow Levee fill, 150 ft south of McHood Road, apparently have been in the fill since original attempts to build a levee, more than 40 years ago. It is not known if they contain fluids, such as oil and gasoline, and it must be presumed they do contain at least some such fluids. Therefore, they are RECs. Those fluids may have leaked and caused small areas of petroleum hydrocarbon soil contamination in the Levee fill. If present, such release(s) readily should be containable, given the apparent small numbers of vehicles present, and probable age and amount of the potential releases.

An operational vehicle lost in the Little Colorado River channel, near the west bank, 200 ft north of the I-40 bridge, contained fuel and other automotive fluids. It is an REC only in the context of Alternative 10.4 of this Corps study, due to its specific location in the river. It is in the zone where fuel and lubricants releases from it would impact river alluvium excavation related to this study, for that one Alternative. It is not in the Levee reconstruction footprint. If all its automotive fluids were released at the location, river current initially would carry them far from the existing Levee and potential Levee realignments, and such fluids would have to migrate a matter of miles downriver before potentially, eventually, coming in contact with the Levee toe. The fluids would be substantially diluted by then. The vehicle since has been removed, vastly lessening the risk of an REC at this location. The former location of the vehicle is downstream of Alternative 10.1, the NED plan and most likely of the study Alternatives to eventually be constructed. Alternative 10.1 would not require moving any river sediment at or near the site where this vehicle formerly was buried.

Neither the Winslow wastewater treatment plant nor the prison complex wastewater treatment plant are potential RECs with regard to this feasibility study due to distance from the Levees and from any individual existing structures that may be raised in elevation. Winslow wastewater treatment plant is in the “zone” where some residential structures may be elevated, but is not close to any such structures. Recall most of that “zone”, as shown on Figure 2, has no structures, and is not developed.

## 5.0 RECOMMENDATIONS

Overview: No study footprint realignments are warranted or possible to fully avoid the anticipated small quantities of wastes. No high-cost remediation or removal is anticipated. Some testing will have to be done before any construction (former railroad grade), and during or before construction (buried vehicle removals). Records search is anticipated to resolve some risk uncertainties on relatively distant groundwater contaminant plumes. Over time, since years are required to bring a feasibility study to fruition as a construction job, monitor regulatory databases to assure no additional wastes releases are discovered and added to the regulatory documentation databases.

A list of site-specific recommendations follows.

Out of an abundance of caution, obtain more information on three verified LUST sites that have free floating product on groundwater, are unremediated or not yet fully remediated, and are less than a mile from a proposed levee realignment:

- Whiting Station #23 fueling station, site #1;
- Phil Bruchman Trading, site #2;
- Duke City Lumber mill site, site #3.

Obtain plume maps for each site, and identify the contaminant(s) of concern at each site, then reassess their potential and classification as RECs relative to this study.

Seek more information, if any, on the unnamed site on Old Clear Creek Rd. (site #4), north of the former mill site. Determine whether it is a verifiable LUST site, and if so, obtain plume maps, and identify the contaminant(s) of concern at each site, then reassess their potential to impact this study.

Avoid to the extent practicable the former railroad track alignment over the Winslow Levee and on adjoining land to the west as shown in Figure 17 and do not plan on using soil on that alignment as levee fill. Anticipate the necessity of a shallow soil removal (three feet or less) type of 'remediation' for any part of the former rail alignment involved in new levee realignment or related construction activity that involves moving soil. If done, soil testing along the alignment that could prove this avoidance unnecessary, should include a check for petroleum hydrocarbons and PCBs in shallow samples.

The 'Kachina' vehicle salvage site at 637 French Rd. should be avoided in any potential Levee construction work zones, borrow areas, and realignments, unless the study wishes to incur the task of moving over 500 salvage vehicles, then verifying that there are no related vehicle fluids spills, or soil or groundwater contamination beneath the vehicles.

Watch for small releases of petroleum hydrocarbons, such as motor oil and gasoline, upon any attempted removal of the buried automobiles that were used as Winslow Levee fill, 150 ft south of the intersection of McHood Rd. and the Levee. Expect to find at least a few other vehicles in this part of the Levee, if extensive Levee excavation is undertaken. At the time of any attempted

vehicle removal, record the visual conditions of the soil around and beneath such vehicles, look for staining, and consider taking confirmatory soil samples to verify clean soils, or to document levels of contamination, if any releases exist.

If Alternative 10.4 is built, monitor river sediment extraction at the location where a vehicle was lost and enveloped in sands of Little Colorado River channel (site #21 on Figures 1 and 2). The monitoring is to assure no petroleum contaminated soils exist at the site where this vehicle was disassembled and removed after becoming enveloped in wet river sediment. The site is not an issue under Alternative 10.1, which is the NED plan.

## **6.0 COSTS**

Further assessment and investigation costs would be cost shared pursuant to ER 1165-2-132. These costs would include obtaining more detailed records for sites 1, 2, and 3, with the expectation that additional data could eliminate these sites as potential RECs with regard to the study area.

The non-Federal sponsor shall be responsible for ensuring that the development and execution of any required HTRW response/remediation actions are accomplished at 100 percent non-project cost. Costs for necessary special handling or remediation of wastes, pollutants and other contaminants which are not regulated under CERCLA may be treated as project costs.

Removing and disposal of the buried vehicles from the northernmost part of the Levee and confirmation testing of the surrounding soils: \$5,000-\$10,000 for the vehicles that are visible. This could rise to \$50,000 if additional vehicles are discovered. This section of the Levee is included in alternatives with structural improvements in Reach 2 but is not included in the Tentatively Selected Plan.

The former railroad track alignment, which can reasonably be anticipated to have some low level contamination, is anticipated to require some shallow soil removal under all alternatives that cannot fully avoid this area, including the Tentatively Selected Plan. Removal of contaminated soil around the former railroad track alignment is estimated to fall in the range of \$50,000 to \$100,000 if hazardous waste is present, and fall to approximately \$25,000 if only Special Waste is present. These costs include some shallow sampling and testing. Such wastes seldom penetrate to the subsurface to depths of 2 ft because the releases are small drops or particles, lost over a long period of time.

No costs are assigned to the Kachina vehicle salvage site as it is apparent at this point in the study that the location will be avoided by all alternatives in the focused array.

The above estimated rough order of magnitude costs for removal/remediation activities are based on regulatory database descriptions of the issues and Corps assessment of the problem, without any additional field and subsurface site investigation or testing. Actual costs could rise or fall, depending on actual site conditions, to be determined in the engineering and design phases of the work.

## 7.0 REFERENCES

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