

DETAILED SITES LIST

SITE NAME	SITE CATEGORY	SITE ID	In Report Text?	WAYPOINT ID	LON	LAT	ADDITIONAL WAYPOINTS	Liquefaction Confirmed	Liquefaction Inferred	Liquefaction Possible	No Liquefaction	Seismic	Evidence of Strong Shaking	No Earthquake Effects Found	Photographs?	NOTES FOR SITES NOT DESCRIBED IN REPORT	
								Liquefaction - Vented Sand	Lateral Spread, Settlement, No Settlement, No Settlement	Minor Cracking, Lateral Extent Variable	Shore Failure of Liquefaction						
Westside Main Canal and Wormwood Canal at the All American Canal	Irrigation Canals	C01	Y	USGS029	-115.662023	32.653463	CGS037, USGS030-032	X	X								
All American Canal West of Pullman Road	Irrigation Canals	C02	Y	USGS027	-115.657355	32.653726	USGS026, USGS028		X								
Westside Main and Wormwood Canals 600 m North of the All American Canal	Irrigation Canals	C03	Y	USGS033	-115.662895	32.658760			X								
Westside Main and Wormwood Canals 550 m north of Anza Road	Irrigation Canals	C04	Y	USGS034	-115.666329	32.668797			X								
Westside Main Canal West Bank 450 m Southeast of State Highway 98	Irrigation Canals	C05	Y	USGS036	-115.671313	32.675266			X								
Westside Main Canal West Bank 250 m Southeast of Highway 98	Irrigation Canals	C06	Y	USGS035	-115.672570	32.676890			X								
Westside Main Canal East Bank 120 m Northwest of Highway 98	Irrigation Canals	C07	Y	USGS037	-115.674871	32.678968			X								
Westside Main Canal from 250 m to 800 m Northwest of Highway 98	Irrigation Canals	C08	Y	USGS038	-115.679027	32.680129	USGS039		X								
All American Canal 370 m West of Brockman Road	Irrigation Canals	C09	Y	USGS024	-115.642366	32.654827			X								
Westside Main Canal East Bank 1300 m Northwest of Highway 98	Irrigation Canals	C10	N	USGS040	-115.685663	32.683769			X							Three open extensional fractures occurred in the Westside Main Canal east levee road, one of these fractures had a small graben structure associated with it. Liquefaction at depth is considered probable owing to the presence of the graben at the head of the failure, but aggregate displacement was small.	
Irrigation ditch between Lateral No. 3 and Lateral No. 5 north of the All American Canal	Irrigation Canals	C11	M-C09	USGS020	-115.639347	32.655300	USGS021-023, USGS025						X				
Westside Main Canal East Bank 1600 m Northwest of Highway 98	Irrigation Canals	C12	N	USGS041	-115.685459	32.686340	USGS109		X								Minor lateral spread ground failure was observed at this location in the failing light of April 6, 2010. The role of liquefaction is uncertain, as no vented soil materials were observed, but the sense of the displacement directly towards the free-face and the arcuate geometry of the ground failure was consistent with liquefaction in a substrate at depth beneath the levee. Repairs to the levee were underway in the morning of the following day.
Westside Main Canal East Bank 1850 m Northwest of Highway 98	Irrigation Canals	C13	N	USGS042	-115.684786	32.688329	USGS108		X								An arcuate ground failure in the east levee of the Westside Main Canal was observed at this location and it showed extensional displacement toward the free face (canal channel). No measurements or photos were obtained and no vented soil materials were observed.
Westside Main Canal East Bank 2000 m Northwest of Highway 98	Irrigation Canals	C14	Y	USGS043	-115.684361	32.689627	USGS107		X								
Westside Main Canal West Bank 380 m South of Kubler Road	Irrigation Canals	C15	Y	USGS106	-115.684237	32.691355			X								
Westside Main Canal West Bank 220 m South of Kubler Road	Irrigation Canals	C16	N	USGS105	-115.684704	32.692728			X								A bank failure along the west levee of the Westside Main Canal was observed from the east side of the canal. Access was problematic, and the magnitude of displacement associated with this failure is not well documented nor is any relation to liquefaction established. This failure appeared to be of a minor nature and no further details were noted.
Westside Main Canal East Bank 250 m Northwest of Kubler Road	Irrigation Canals	C17	Y	USGS044	-115.686326	32.696776	USGS104, USGS013, USGS014		X								
All American Canal at the Woodbine Lateral 2	Irrigation Canals	C18	Y	UCLA_AAC1	-115.620765	32.656451			X	X							
Westside Main Canal east bank 150 m south of Wormwood Canal Lateral 3A	Irrigation Canals	C19	N	USGS103	-115.684375	32.707537	USGS102		X								WPUSGS102 - Westside Main Canal in the vicinity of Wormwood Lateral 3, 3A. Fifty-meter-long area has been re-graded; the nature of the damage is no longer discernible. WPUSGS103 - This is the center of a repaired and repaired 50 m long reach of the east levee of the Westside Main Canal. Nature of original damage and repairs no longer discernible. Text - Two heavily re-graded 50 m reaches of the east levee of the Westside Main Canal were observed in this area. The nature of the ground failure could not be established in either owing to repairs already having been made as of April 7, 2010.
Anza Road and Rockwood Road	Irrigation Canals	C20	N	USGS012	-115.620678	32.664659							X				Junction of Anza Road and Rockwood Road. No damage locally to Woodbine Lateral 2 canal. Construction dated 1960. Imperial County survey monument CO-M-2 (1971) noted at canal abutment.
Westside Main Canal West Bank 340 m Southeast of Lyons Road Bridge	Irrigation Canals	C21	N	USGS101	-115.687591	32.712882			X								A small slump was observed in the west bank of the Westside Main Canal from the vantage of the east bank access road. The integrity of the levee was not threatened and the slump had been repaired at the time of our visit on April 7, 2010.
Westside Main Canal at Lyons Road and Lateral No. 4 Canal	Irrigation Canals	C22	N	USGS099	-115.690730	32.715555			X								Damage to Lateral No. 4 Canal leading to the NNE of the Westside Main Canal was apparent as repairs were ongoing on 4/7/10. The nature of the damage was not discernible due to the repairs in progress, but damage to the gate structure controlling flow to the lateral canal is suspected.
Westside Main Canal West Bank 340 m Northwest of Lyons Road	Irrigation Canals	C23	N	USGS098	-115.692928	32.718324			X		X						A minor bank failure was observed on the west bank of the Westside Main Canal. There was no apparent engineering significance to this ground failure. No earth materials were vented and any relation to liquefaction is uncertain.
Westside Main Canal West Bank 1170 m Northwest of Lyons Road Bridge	Irrigation Canals	C24	Y	USGS110	-115.697464	32.723512	USGS097	X	X								
Westside Main Canal East and West Banks South of Vogel Road	Irrigation Canals	C25	Y	USGS111	-115.698874	32.724414	USGS096	X	X								
All American Canal at the Gresson Drain	Irrigation Canals	C26	Y	UCLA_AAC2	-115.599235	32.650775			X	X							
Westside Main Canal East Bank 420 m Northwest of Vogel Road	Irrigation Canals	C27	N	USGS095	-115.702693	32.727240			X	X							The east bank levee of the Westside Main Canal experienced an 8 m long slump at this point; this site was repaired shortly after it was visited on 4/7/10.
Westside Main Canal east bank 450 m southeast of Liebert Road	Irrigation Canals	C28	N	USGS093	-115.710001	32.730399			X	X							Minor cracking noted. No engineering significance; no photos or measurements.
Westside Main Canal and Fern Canal at Liebert Road	Irrigation Canals	C29	Y	USGS092	-115.714417	32.731265	USGS112, USGS113	X	X				X				
Westside Main Canal East Bank 2050 m Northwest of Liebert Road	Irrigation Canals	C30	N	USGS089	-115.733913	32.737317			X								Recent grading at this location indicated repairs probably had been made to a levee failure that extended for about 100 m sub-parallel to the Westside Main Canal. The nature of the original damage could not be determined.
Westside Main Canal East Bank 1360 m Southeast of Hyde Road	Irrigation Canals	C31	N	USGS088	-115.736539	32.739999			X								Recent grading indicated repairs probably had been made to a levee failure that extended for about 100 m sub-parallel to the Westside Main Canal. The nature of the original damage could not be determined.
Westside Main Canal East Bank 800 m Southeast of Hyde Road	Irrigation Canals	C32	N	USGS087	-115.740888	32.742601			X								Repairs to a failed section of the east levee of the Westside Main Canal were in progress at 1545 hours on 4/7/2010. The operator of the Caterpillar D6 bulldozer stated that the failure had extended about 1/3 of the distance across the crest of the levee. No measurements of horizontal displacement or differential vertical settlement were obtained.
Westside Main Canal East Bank 400 m Northwest of Hyde Road	Irrigation Canals	C33	Y	USGS085	-115.752681	32.745971			X								
Westside Main Canal West Bank 30 m South of Forgetment Lateral No. 1	Irrigation Canals	C34	Y	USGS084	-115.752344	32.750252			X		X						
Westside Main Canal East Bank 775 m Northwest of Hyde and W. Vaughn Roads	Irrigation Canals	C35	Y	USGS083	-115.759436	32.761936			X								
Westside Main Canal West Bank 875 m Southeast of Interstate Highway 8	Irrigation Canals	C36	Y	USGS082	-115.766749	32.767265			X		X						
Wistaria Canal at the All American Canal	Irrigation Canals	C37	Y	UCLA_Wistaria	-115.550881	32.661892			X				X				
Westside Main Canal West Bank 860 m Southeast of Interstate Highway 8	Irrigation Canals	C38	N	USGS081	-115.768754	32.768171			X								
Westside Main Canal East Bank 750 m South of Union Pacific Bridge	Irrigation Canals	C39	N	USGS079	-115.772972	32.782555			X								A small slump was noted in the east levee of the Westside Main Canal at this location. Less than about 4 m ³ of material was slumped; the vertical component of the deformation amounted to about 34 cm, down to the west. No vented soil was observed and the role of liquefaction is uncertain.
Eucalyptus Canal along Nichols Road north of McCabe Road	Irrigation Canals	C40	Y	CGS042	-115.603493	32.754707			X			X					
Westside Main Canal West Bank 30 m South of Union Pacific Bridge	Irrigation Canals	C41	N	USGS078	-115.772360	32.788868			X								
Central Main Canal along Austin Road north of McCabe Road	Irrigation Canals	C42	Y	CGS063	-115.594812	32.752318			X	X	X						A small slump occurred in the bank of the Westside Main Canal west levee. No engineering significance to this ground failure, which presumably is not related to liquefaction.
Beech Canal at Dogwood and Cole Roads	Irrigation Canals	C43	N	USGS005	-115.534151	32.694152			X				X				Dogwood Road and Cole Road, northwest quadrant of this intersection. Minor cracking of concrete channel noted; no sand vented. Probable shaking damage. Canals functioning. No apparent liquefaction. Stacked fodder bales toppled.
Westside Main Canal West Bank 2100 m Northeast of Evan Hewes Highway	Irrigation Canals	C44	Y	CGS016	-115.756256	32.802098	USGS156		X	X							
Westside Main Canal West Bank 4600 m Southwest of the Bridge at Westmoreland Road	Irrigation Canals	C45	N	USGS155	-115.751080	32.819452	USGS015		X	X							Set of arcuate extensional fractures about 30 m long extend across 10 m wide levee roadway along Westside Main Canal.
Central Main Canal along Austin Road South of Interstate Highway 8	Irrigation Canals	C46	Y	CGS041	-115.594872	32.772329			X	X							
Westside Main Canal West Bank 3500 m Southwest of the Bridge at Westmoreland Road	Irrigation Canals	C47	N	USGS154	-115.754551	32.819624	CGS014		X								A waypoint USGS154, a small slump spanned about 25% of the width of the west levee road, extending about 2.5 to 3 meters from the canal's margin. No vented materials were observed, and the relation of this ground failure to liquefaction is uncertain.
Eucalyptus Canal along Nichols Road South of Evan Hewes Highway	Irrigation Canals	C48	Y	CGS043	-115.603573	32.759501			X			X					
Westside Main Canal West Bank 2450 m Southwest of the Bridge at Westmoreland Road	Irrigation Canals	C49	N	USGS153	-115.755204	32.829291	CGS013		X	X							A waypoint USGS153, a set of extensional fractures extended across 65-70% of the width of the levee road. No measurements were taken as displacements were small. Relation to liquefaction is uncertain, but the morphology of the failure is consistent with liquefaction.
Westside Main Canal West Bank 2200 m Southwest of the Bridge at Westmoreland Road	Irrigation Canals	C50	Y	USGS152	-115.755330	32.831198	CGS012		X	X							
Westside Main Canal at the Fillaree Canal Diversion, South of the Bridge at Westmoreland Road	Irrigation Canals	C51	Y	USGS150	-115.739856	32.843678	CGS010, USGS151		X	X							
Westside Main Canal East Bank 300 m Northeast of the Bridge at Westmoreland Road	Irrigation Canals	C52	M-C51	USGS149	-115.736296	32.845563	CGS009		X		X						
Westside Main Canal East Bank 200 m Southwest of Huff Road	Irrigation Canals	C53	N	USGS148	-115.720228	32.856056			X	X							Slumped area noted in levee fill along east side of Westside Main Canal. Proceed south towards confluence with Westside Main Canal.
South Alamo Canal at the All American Canal	Irrigation Canals	C54	N	CGS028	-115.584078	32.674123			X					X			Site had reported liquefaction from the 1979 earthquake; none found for this earthquake.
All American Canal at the Alamo River	Irrigation Canals	C55	Y	UCLA_AAC3	-115.370425	32.674919			X								
Rosita Canal North of Bell and Alamo Roads	Irrigation Canals	C56	Y	CGS045	-115.440264	32.818924	CGS054	X	X	X							
All American Drain No. 13 at Brockman Road	Drains and Rivers	D01	N	USGS019	-115.638121	32.655420	USGS015-018			X	X		X				WPUSGS015 - Minor slump and 10 m long arcuate extensional fractures in north bank of drainage canal. No liquefied materials vented; WPUSGS016 - Bank of drainage canal shows recent raveling, probably induced by earthquake shaking. No vented materials. WPUSGS017 - Here, and for next 100 m to west, pre-4-4/2010 slumps are broken by earthquake-induced shaking. WPUSGS018 - Toppled fodder bales (inter roadway). WPUSGS019 - Minor slumps in both walls of drainage canal and situated north of All American Canal. Report Text - Both banks of the All American Drain No. 13 east of Brockman Road experienced shallow sloughing and slumping for a length of about 500 m. Slumps that clearly predate the earthquake were also present, but even these had shaking-loosened soil at the tops of their scarps. Toppled hay bales were also observed here.
No. 2 Drain along Lyons Road	Drains and Rivers	D02	N	CGS024	-115.670317	32.716035			X								Nearly continuous shallow sloughing of the drain south bank for a distance of at least 100 m; no liquefaction.
Gresson Drain at Lyons Road	Drains and Rivers	D03	Y	CGS023	-115.658978	32.715847			X	X							
Fig Drain East of the Westside Main Canal 700 m Southeast of Liebert Road	Drains and Rivers	D04	Y	USGS094	-115.707198	32.729819			X								
Dixie Drain No. 3B along Westside Main Canal 1240 m northwest of Liebert Road	Drains and Rivers	D05	Y	USGS091	-115.727061	32.733330			X								
Dixie Drain No. 3B along Westside Main Canal 1570 m northwest of Liebert Road	Drains and Rivers	D06	Y	USGS090	-115.730006	32.734990			X								
Fig Drain South of Fig Lagoon	Drains and Rivers	D07	Y	CGS028	-115.702010	32.674123			X								
New River Flood Plain 550 m west of Drew Road	Drains and Rivers	D08	N	USGS054	-115.696102	32.760910			X								Lateral spread ground failure in road fill and/or recent alluvium of New River. Failure is about 100 m long, and shows about 25 cm of extension towards New River channel.
New River Flood Plain southeast of New River and Fig Drain	Drains and Rivers	D09	M-D10	USGS056	-115.699771	32.762520	USGS055	X	X								WPUSGS055 - Several lateral spreads noted in this area. No measurements or photos here. WPUSGS056 - New River terrace deposits and possibly some fill; area at least been graded locally. Lateral spreading with vented sand is present.
Fig Lagoon at the New River	Drains and Rivers	D10	Y	USGS061	-115.695357	32.767746	CGS038, 40, USGS067-69	X	X		X	X	X				
New River at the Rio Bend Golf Course	Drains and Rivers	D11	Y	USGS052	-115.693956	32.767924			X	X							
Rice Drain No. 3 North of Evan Hewes Highway	Drains and Rivers	D12	Y	CGS021	-115.638078	32.797189			X	X							
New River Flood Plain, Calexico	Drains and Rivers	D13	M-F04	UCLA_New_River	-115.507250	32.669306	CGS031, CGS032	X	X	X			X				
Alamo River at the All American Canal	Drains and Rivers	D14	M-C55														