Gazetteer 1: *Saqiya* pots

Site	No. of pots	Comments	Date	References
Akhviz, Israel	1+		Late Roman	Ayalon *et al.* 2000, 225.
Aleppo, Syria	2 +	Stray finds	Late Roman	Schiøler 1973, 100, fig. 75.
Andarin, Syria	60 +	Bathhouse	Late Roman	Decker 2001, 129.
Apollonia, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Ashqelon, Israel	1+	Circular installation with pit in centre with several fragments of *saqiya* vessels	Late Roman	Ein Gedy 2002, 90*; Ayalon *et al.* 2000, 226.
Be'er Rozez, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Beth Dagan, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Beth Govrin, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Caesarea, Israel	1 ?+	Mosaic floor L17	6th century or later	Peleg *et al.* 1992, 143, 146; Ayalon *et al.* 2000, 225.
Caesarea, Israel	1+	Deposit L18b butting wall 10	6th century or later	Peleg *et al.* 1992, 139, 148, 165; Ayalon *et al.* 2000, 225.
Caesarea, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Caesarea, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Dor, Israel	1	Two fragments from drainage system. Smooth base and neck rubbed by ropes. Capacity 0.8–1.4 litres.	Probably 2nd – 3rd century	Guz-Zilberstein 1995, 324; Ayalon *et al.* 2000, 225.
Dor, Israel	1	Complete. Attributed to floor L4042.	100 BC – AD 100	Guz-Zilberstein 1995, 324; Stern *et al.* 1995, 104, 233, 264.
Dor, Israel	1+	Many sherds found in fields	?Roman	Gz-Zilberstein 1995, 324.
Epiphania, Syria	?		?Roman	Decker 2001, 129.
Gelilot, Israel	1		Late Roman	Haddad *et al.* 2003, 37*-38*.
Hedera, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Herziliyya, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Horbat Hanut, Israel	1+	Oval cistern	Late Roman	Segal 2003, 36*-37*.
Horbat Kosit, Israel	1+	Bell-shaped cistern	5th-6th century	Ganor *et al.* 2003, 72*-73*.
Horvat Bet Rosh, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Horvat Bezalot, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Horvat Eqqev, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Horvat Hanut, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Horvat Migdan, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Horvat Rozez, Isarel	?		Late Roman	Ayalon *et al.* 2000, 226.
Horvat Uza, Israel	1+	Pottery kiln	4th – 5th century	Getzov 1993, 21, fig. 19; Ayalon *et al.* 2000, 225.
Jaffa, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Jalil, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Jerash, Jordan	?		?Roman	Decker 2001, 129.
Kefar Ara, Israel	1+	Found either in courtyard or in burial chamber	Late Roman	Sussman 1976, 99; Ayalon *et al.* 2000, 225.
Kefar Manda, Israel	1 +	Bottom of silted well, c. 1.5 litre capacity	4th - 6th century	Schiøler 1973, 100, fig. 76; Oleson 1984, 217, 355, 366; Ayalon *et al.* 2000, 223.
Kefar Saba, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.

Site	No of pots	Comments	Date	References
Khirbet al Jiljil, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Khirbet al Khadra, Tel Aviv, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Khirbet Ibreiktas, Israel	2+	One complete vessel and four sherds from lower layer of well 2.2 m in diameter and c. 6.5 m deep	3rd – mid 4th century	Kletter 1998, 44; Ayalon *et al.* 2000, 225.
Khirbet Jalame, Israel	2		Late Roman	Johnson 1988, figs 751, 754, 759; Ayalon *et al.* 2000, 225.
Lod, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Neocaesarea, Syria	4		Late Roman	Harper 1980, 340; Decker 2001, 126.
Netanya, Umm Khalid, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Netanya, Umm Khalid, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Or Akiva, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Shuni, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Tel Afar, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Tel Ashdod, Israel	1+	Stone-built well	Late Roman	Baumgarten 1999, 66*.
Tel Hefer, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Tell Qasile, Israel	?		Late Roman	Ayalon *et al.* 2000, 225.
Tiberias, Israel	?		Late Roman	Ayalon *et al.* 2000, 226.
Yafo, Israel	1	Found in a grave	Late Roman	Ginzburg 2000, 42*.
Yaham, Israel	1+	Found in a grave	Late Roman	Birman *et al.* 2001, 40*-42*.
Yavne Yam, Israel	?		Late Roman	Ayalon 1999, 72*-73*; Ayalon *et al.* 2000, 225.
Zenobia, Syria	2 +	Bathhouse well 3.1 m x 1.6 m, one complete.	Roman	Lauffray 1991, 125; Orssaud 191, 248, fig. 123.38.

Gazetteer 2: Irrigation channels

Site No	Name	River	Date	Reliability Of Date	Element	Length (km)	Comments
597	Auzara	Euphrates	Late Roman	Medium	Channel 1	5	[Decker 2001, 101] [Lauffray 1983, 54]
597	Auzara	Euphrates	Late Roman	Medium	Channel 2	4	Followed for 4 km. Ended in modern village of Djaufra [Decker 2001, 101]. Possibly associated with a basalt dam [Lauffray 1983, 54].
597	Auzara	Euphrates	Late Roman	Medium	Dam	4	basalt dam [Lauffray 1983, 54].
597	Auzara	Euphrates	Late Roman	Medium	Channel 3		Probably fed by norias [Decker 2001, 101] [Lauffray 1983, 55]
592	Barbalissos	Euphrates	Late Roman/ Umayyad	Medium	Channel	30	Winds along Euphrates terrace from Al Tannuz and flowed within 300 m of city walls (but not into them). Possibly Umayyad, but restoration of an earlier irrigation channel. [Decker 2001, 99; Lauffray 1983, 52-3]
595	Callinicum	Euphrates	Islamic	Low	Channel	15	Downstream of Sura another irrigation channel starts near Qal'at Nemrod (?Thapsacus) [Decker 2001, 100]. Could have irrigated 3000 ha. Possibly fed by a noria [Lauffray 1983, 53].
598	Circesium	Euphrates	Late Roman	High	Channel	15	Nahr Said Branches off Euphrates 15 km upstream from Circesium near Moubarak > near et-Tala'a Abou Nuhud, near Tell Ashara continues to Qal'at Rahba [Decker 2001, 101; Lauffray 1983, 55]
601	Damascus	Barada			Channel 1		Daiwani Departs Sufania near Bab Tuma; 4 divisions supply N fields of city [Decker 2001, 105] Irrigates 150 ha [Tresse 1929, 469]
601	Damascus	Barada	Late Roman	Low	Channel 2		Mezzawi Issues Barada gorge > S of city Watered trees and gardens of SW plateau above Barada Village of this name known from Diocletianic era [Decker 2001, 106, 107]
601	Damascus	Barada	Late Roman	Low	Channel 3		Derani (Adaya) Issues right bank of Barada Runs close to Mezzawi and Roman aqueduct. Irrigates SW of city. Village of this name known from Diocletianic period [Decker 2001, 106, 107] [Tresse 1929, 471]
601	Damascus	Barada			Channel 4		Akrabani Bifurcates and waters villages SW of Ghouta [Decker 2001, 106] Irrigates 67 ha [Tresse 1929, 469]
601	Damascus	Barada	AD 661/Islamic	Low	Channel 5	15	Yazid Left bank of Barada near el Hameh Highest 730 m alt N and E: defines limits of irrigated band of Ghouta [Decker 2001, 106] Dated by Kamel [1990, 386] to AD 661 [Tresse 1929, 468] Dug by Khalif Yazid ibn Mu'awiyah (Dimashki AD 1300) [Le Strange 1890, 265]

Site No	Name	River	Date	Reliability Of Date	Element	Length (km)	Comments
601	Damascus	Barada	Late Roman	Low	Channel 6	18	Thaura Parallel to Yazid at 720 m alt Empties into lake to E. Waters suburbs Oldest [Kamel] Built by a Greek called Thaura. In service in late Roman period [Decker 2001, 106, 107] Irrigates 60 ha [Tresse 1929, 468] [Le Strange 1890, 266]
603	Damiyah		Late Roman/ Umayyad	Medium	Channel		In modern Jordan, near Deir Alla. [Decker 2001, 110]
596	Dausara	Euphrates			Channel 1		Left bank of Euphrates. Flowed from Chahba to city [Decker 2001, 101; Lauffray 1983, 55].
596	Dausara	Euphrates	pre-7th	High	Channel 2	20	Left bank of Euphrates Flows E towards Heraclea past Tell Mariash 5-7 m high accumulation of soil suggests long period of use Cut by Umayyad qanat, therefore pre C7 [Decker 2001, 101; Lauffray 1983, 55]
593	Dibsi Faraj	Euphrates	Late Roman	Medium	Channel		Small irrigation channel flowed N of city near walls [Decker 2001, 100]. Shaft dug down beneath groundwater surface of floodplain feeds water to internal shaft where water could have been lifted within the safety of the city walls [Wilkinson 1975, 337, fig H]
622	Haseke (south)	Khabour	Late Roman	High	Channel 1		Saba Skur [Decker 2001, 103] Toponym = seven dams [Lauffray 1983, 61]
622	Haseke (south)	Khabour	Late Roman	High	Channel 2		Nahr at-Taff Provided irrigation for 30 km stretch around ancient Arabana, home of *legio III Parthica* [Decker 2001, 103; Lauffray 1983, 62]
622	Haseke (south)	Khabour	Late Roman	High	Channel 3		Nahr Sarruat Ends S of Tell Suwar [Decker 2001, 103; Lauffray 1983, 62]
622	Haseke (south)	Khabour	Late Roman	High	Channel 4		Nahr Marqada [Decker 2001, 103] Bridge dam marks beginning [Lauffray 1983, 62]
622	Haseke (south)	Khabour	Late Roman	High	Dam		Bridge dam marks beginning of Channel 4 [Lauffray 1983, 62]
622	Haseke (south)	Khabour	Late Roman	High	Channel 5		Nahr al-Jum/Nahr al-Hama N of Tell Suwar Flowed into area around Circesium at terminus of Khabour [Decker 2001, 103] [Lauffray 1983, 62]
159	Homs	Orontes	3rd century AD	High	Channel		Off Homs dam [Calvet and Geyer 1992a, 32; Conder 1883, 41.]
123	Homs - Tell Chor	Orontes	3rd century AD	High	Channel		Basalt channel off Homs dam [Conder 1883, 41; Calvet and Geyer 1992a, 32; Seyrig 1959, 189.]
160	Homs -Rabi'a	Orontes	3rd century AD	High	Channel		Spillway from Homs dam takes water to channel [Conder 1883, 41; Calvet and Geyer 1992a, 32; Seyrig 1959, 189.]

Site No	Name	River	Date	Reliability Of Date	Element	Length (km)	Comments
626	Nahr al-Abbara/Nahr Turkman	Balikh	6th -8th	High	canal		Clearly not a river as straight rather than sinuous course Original channel = grey levee 5-8 m wide strewn with occ limestone and pottery Large limestone blocks (0.5-1.0 m long) occur every 0.5 -1 km and may be sluices as positioned at or near junctions along channel trace. Infilled by aggradation [Wilkinson 1998, 68-69]
600	Nahr Dawwarin (Tell Seker)	Khabour	Babylonian	Medium	Channel		Possibly restored in Antiquity Flows by Tell Seker which was reoccupied in the Roman period P Dura 101: bill of sale for land [Welles 1937] [Decker 2001, 104] Lauffray [1983, 51] believes not in use in late Antiquity.
627	Sahlan-Hammam	Balikh	3rd BC – 6th AD	High	Channel		Functioned in Hellenistic and Parthian period (pottery) and ceased to flow during late Roman period (charcoal) [Wilkinson 1998, 69-7; Decker 2001, 102]
594	Sura	Euphrates	Late Roman	Medium	Channel		Trace of ancient channel probably dates to time when Sura was headquarters of *legio XVI Flavia Firma* [Decker 2001, 100].
620	Tel Dibs/Thallaba	Khabour			Dam		Feeds channel [Decker 2001, 103] 2 km from Tell Hormis and tell Umm Gharqan Possible second dam to W [Lauffray 1983, 61]
620	Tel Dibs/Thallaba	Khabour	Roman	High	Channel		Al Breij Flows around Roman camp and continues E to Dabausa [Decker 2001, 103]
617	Tell Agaga	Khabour	Roman/Arab	Low	Channels		System of channels encircles town At W limit of channels, aerial reconnaissance revealed a camp guarding the N of the city and the cultivable area [Poidebard 1934, 137, pl 7.2]
618	Tell Tamer	Khabour	Late Roman	Medium	Channel	40	Called Qattina in modern parlance Irrigated several thousand ha Terminates in territory of Theodosiopolis [Decker 2001, 103; Lauffray 1983, 60]
619	Thallaba	Khabour	Late Roman	Medium	Channel		Called Ubeyan Irrigates region of Umm Gharqan and fortified town ofThallaba Sections on both left and right banks Irrigated 12000 ha area [Decker 2001, 103] [Lauffray 1983, 61]
619	Thallaba	Khabour			Dam		Feeds channel Near Tell Roumman [Lauffray 1983, 61]
621	Thannouris	Khabour			Bridge-dam		15 km below confluence of ancient Mygdonius and Khabour Has Roman foundations. Fills channel [Decker 2001, 103] Creates a 3 m water chute [Lauffray 1983, 61]
621	Thannouris	Khabour	Roman	High	Channel		Sfaya channel Fed by bridge dam 3 m wide [Decker 2001, 103] [Lauffray 1983, 61]

Gazetteer 3: Qanats

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
669	Ain Evrona (Dafieh)	Israel		Persian, Roman or Umayyad	Low	qanat				At least 2 separate chains Twin qanat comprising double line of shafts leading to double line of open channels which cross wadi on a bridge. Some of the water > reservoir, some > irrigated area. [Evenari *et al.* 1982, 177] 3 rows of shafts, two of which are parallel 15 m apart. Rows are 400 m and 425 m long respectively Shafts and tunnel have rectangular shape Some sections between shafts do not follow straight line due to bad excavation teams [Ron 1989, 216]
670	Ain Marsev (Zureib)	Israel		Persian or Roman	Low	qanat				6 chains of wells [Evenari *et al.* 1982, 177]
611	Aleppo	Syria								Used until beginning of C20 [Kobori 1990, 324]
677	Amsareddi	Syria	Limestone	Roman or late Roman	Medium	qanat	900/725 + 1250 + 250			Two water capture galleries and one water channel gallery. One water capture gallery runs S; follows right bank of ravine for 900 m; has 18 wells. The other runs SE for 750 m; has 15 wells. Both branches join at collector well at the beginning of the water channelling gallery, which runs NE following natural slope of terrain; after 1.25 km with 40 wells, it surfaces and becomes open channel 250 m long Wells: 1 m square opening; 16 m deep (max); some have masonry revetted walls - some are covered with stone slabs at the level of the rock Galleries: 0.8 m x 1.5 m in x-section and longitudinal profile has minimum slope of 0.5 m in a km Open channel: masonry built; x-section: 0.2 m x 0.3 m Construction looks Roman and other remains, e.g. fort on the site date to end of C2 to early C3. [Mouterde and Poidebard 1945, 118-120]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
677	Amsareddi	Syria	limestone	Roman or late Roman	medium	reservoir	60	60		Earthern reservoir [Mouterde and Poidebard 1945, 118-120]
613	Anasartha (Al Hammam)	?Syria		AD 604	High	qanat				Possibly built under imperial initiative as some territory belonged to *res privata* [Decker 2001, 122]
625	Andarin	Syria				reservoirs				Two; one for each qanat [Mango *et al.* 2001]
625	Andarin			Late Roman	High	qanat 1				Feeds SE reservoir Traced for c 1.5 km Bifurcates near reservoir Source might be Ain Zarqa [Decker 2001, 119] [Geyer 2000]
625	Andarin			Late Roman	High	qanat 2				Feeds NW reservoir Possesses multiple branches from W that exceed 6 km length Bifurcates as approaches reservoir [Decker 2001, 119; Geyer 2000]
623	Birke de Qdeym	Syria	chalk/ limestone	Late Roman or Umayyad	Low	qanat	9000.00	0.80	1.60	Over 200 wells Max 20 m deep Gradient min 5 m in a km Cross-section: 0.8 m x 1.6 m Gallery has masonry revetment Drains into reservoir earthern reservoir [Mouterde and Poidebard 1945, 120-2]
623	Birke de Qdeym	Syria	Chalk/ limestone	Late Roman or Umayyad	Low	reservoir	62.00	62.00	3.00	At El Birke 10 km to N Has large circular corner platforms of unknown function Small channel runs around structure c 0.25 m above intake level 4200 m^3 Large settling tank upstream of inlet Sluice and derivation directing water to cultivated land around reservoir [Mouterde and Poidebard 1945, 122-126; Decker 2001, 120-121]
651	Ein Yahav	Israel: N Arava valley		Roman, Late Roman or early Arab	Low	qanat 7				One of seven qanat systems in the northern Arava valley near the spring of Ein Marzev [Ron 1989, 214-216]
651	Ein Yahav			Roman, Late Roman or early Arab	Low	qanat 1				30 shafts at c. 10 m intervals tunnel with groundwater 4 m below surface Excavated in clay deposits without any support of stone walls [Ron 1989, 214-216]
651	Ein Yahav			Roman, Late Roman or early Arab	Low	qanat 2				[Ron 1989, 214-216]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
651	Ein Yahav			Roman, Late Roman or early Arab	Low	qanat 3				[Ron 1989, 214-216]
651	Ein Yahav			Roman, Late Roman or early Arab	Low	qanat 4				[Ron 1989, 214-216]
651	Ein Yahav			Roman, Late Roman or early Arab	Low	qanat 5				[Ron 1989, 214-216]
651	Ein Yahav			Roman, Late Roman or early Arab	Low	qanat 6				[Ron 1989, 214-216]
640	En Sabarim	Israel		Roman	Low	mother well			5.00	Upper part of large dressed stones, lower carved into rock Two tunnels open into shaft, one to NW and one to SE Water was seen to seep from lower part of the shaft [Siegelmann 1986, 29]
640	En Sabarim			Roman	Low	tunnel 1	45.00	0.70	1.75	Rises from well in NW direction Narrow channel at base 0.4 x 0.4 m 3 shafts traced along its way Ends in two compartments Niches for lamps carved in walls near ceiling Water was seen to seep from the sides of this tunnel [Siegelmann 1986, 29]
640	En Sabarim			Roman	Low	tunnel 2		0.70	1.75	Descends from well in SE direction Narrow channel at base 0.4 x 0.4 m Not cleared [Siegelmann 1986, 29]
650	Fasayil	Israel		Roman, Late Roman or early Arab	Low	qanat 1	2200.00			W bank of Jordan valley, W of salt marsh Al Mallha System A 3 rows of shafts: largest system A1 is 2.2 km long [From the illustration 2 are feeder rows into the main tunnel] [Ron 1989, 214]
650	Fasayil			Roman, Late Roman or early Arab	Low	qanat 2				W bank of Jordan valley, W of salt marsh Al Mallha System B: 2 rows of shafts B1: 22 shafts at 22 m intervals Segment of built tunnel was found which may be part of this system: built of uncemented fieldstones and capped with slabs: c 1.15 m - 1.75 m high [Ron 1989, 214]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
650	Fasayil			Roman, Late Roman or early Arab	Low	qanat 3				W bank of Jordan valley, W of salt marsh Al Mallha [Ron 1989, 214]
649	Ghor Nimrin (Kibid)	Israel	marls and clays	Roman	Medium	tank				At Besset el Resas Seems to be focus of qanat system [Ionides and Blake 1939, 163-4]
649	Ghor Nimrin (Kibid)			Roman	Medium	aqueduct				At Besset el Resas Seems to be associated with qanat system [Ionides and Blake 1939, 163-4]
649	Ghor Nimrin (Kibid)			Roman	Medium	qanat 1	300.00			Lower Jordan Valley One of 6 on E bank of Ghor Nimrin and Ghor Kibid near salt marshes of Bassat al Hallaf and Bassat al Ressas After clearance had a flow of 36-72 m3 per hour Groundwater in mother well: 14 m below ground surface Shallowest shaft 5.5 m Open ditch allowed water to stream for 200 m from shallowest shaft until reached ground level Gallery not lined Seems to focus on Besset al Resas near which are ruins of tank and aqueduct [Ionides and Blake 1939, 163-4, 168; Ron 1989, 214]
649	Ghor Nimrin (Kibid)			Roman	Medium	qanat 2				[Ron 1989, 214]
649	Ghor Nimrin (Kibid)			Roman	Medium	qanat 3				[Ron 1989, 214]
649	Ghor Nimrin (Kibid)			Roman	Medium	qanat 4				[Ron 1989, 214]
649	Ghor Nimrin (Kibid)			Roman	Medium	qanat 5				[Ron 1989, 214]
649	Ghor Nimrin (Kibid)			Roman	Medium	qanat 6				[Ron 1989, 214]
610	Hierapolis	Syria		Roman or Late Roman	Medium	qanat				'We rode by the air holes of underground canals, of which there were a great number bringing water to Hierapolis.' [Bell 1911, 20] ‘From this quarter may be traced the two roads which led to the Zeugmas; also the remains of a Khanat running in the direction of the Sajur, from whence this work, so peculiar to the Assyrians, probably brought a supply of water.’ [Chesney 1850, 421]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
601	Hierapolis			Roman or Late Roman	Medium	qanat 1	25, 000			Bi'r Jalu. Would connect with caput aquae from W hillslopes of mountains of Qal'at Naym near Hierapolis [Egea Vivancos poster *Cura Aquarum in Ephesus* 2004]
601	Hierapolis			Roman or Late Roman	Medium	qanat 2				SW qanat. Most important branches join in single branch at Al Gara'a [Egea Vivancos poster *Cura Aquarum in Ephesus* 2004]
601	Hierapolis			Roman or Late Roman	Medium	qanat 3				From Hammam Sagir close to river. May be connected with spa or thermal spring [Egea Vivancos poster *Cura Aquarum in Ephesus* 2004]
602	Lebwe	Syria				qanat				2 principal branches Irrigated 7-8000 ha in 1930s Derivation to Roman fort at Hasye Becomes subterranean system at Sadad: supplemented by qanats from Wadi Nebk Emerges at Qnaye, 94 km from Lebwe - to S divides at Gontor [Decker 2001, 108-9]
602	Lebwe			Roman, late Roman or Umayyad		reservoir	70.00	70.00		At Qnaye Over course of channel leading from qanat About 700 m from the main enclosure [Mouterde and Poidebard 1945, 150-1, fig. 16]
602	Lebwe			Roman, late Roman or Umayyad		qanat				At Qnaye Aerial photographs suggest that this qanat is an extension of a system which leaves at the source of the Orontes and which is traditionally called the 'Zenobia canal' or 'the ancient aqueduct of Palmyra' [Mouterde and Poidebard 1945, 151]
612	Palmyra	Syria	limestone	Roman	Medium	qanat 1	3000.00	0.40	2.00	Valley of Tombs Abu el Fawares Five channels cut into hill feed qanat and congregates in a 30 m deep well Underground channel: 5 km then turns into open channel to Diocletian's Camp [Crouch 1975, 162-164, fig. 8] Feeds terracotta and later stone pipeline in city [Bounni and Asad 1989, 130] Rectangular in shape [Kobori 1989, 8]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
612	Palmyra			Roman	Medium	qanat 2				Oval Plaza [Crouch 1975, 164-5] [Bounni and Asad 1989, 130]
612	Palmyra			Roman	Medium	qanat 3		0.80	2.50	Qanawat al-Umm al-Omi Uses sources from piedmont of Jebel Chifa, N of Palmyra Observed by Moussly Nine steps of marble and an entrance gate with sculptured arcade Rectangular galleries [Kobori 1989, 9; Wood 1753]
635	Qasr al Mushash	Jordan		Late Roman or Umayyad	Low	qanat				Several lines Northern line has secondary branch towards Wadi al Mushash and 2 branches forking at E extremity Another line runs south Circular mounds of small stones [King *et al*. 1983, 391, plate 87]
623	Qdeym	Syria	chalk/ limestone	late 2nd century AD or Umayyad	Low	qanat	1850.00			Along valley of wadi Qdeym Seems to be contemporary with primary phase of castellum (2nd or 3rd century AD). Irrigates a few hectares [Mouterde and Poidebard 1945, 112] Result of four water capture galleries with a total of 160 shafts. Radial galleries are most important: have shafts at 20-30 m intervals Central galleries: wells at 5-6 m Galleries have irregular profile due to friable tuf Qanat opens in an irrigation channel [Mouterde and Poidebard 1945, 120-121; Tate 1997, 62]
614	Shallalah Saghira	Syria		Late Roman	High	qanat				Before restoration 129.6-172.8 m3 daily rate [Decker 2001, 122]
624	Taibe	Syria	alluvial plain	pre-1400 AD	Low	qanat 1		1.00	1.80	Main qanat Source A under N slope of tell. Source B under E slope of tell Tunnel narrows up to 0.45 m Channel: 0.35-0.4 m wide and has inverted triangle shape at base Blocks for construction come from surrounding area Shafts (c. 50) are masonry construction Flows into hexagonal reservoir: 55 m x 20 m [Kobori *et al.* 1980, 54-58; Mouterde and Poidebard 1945, 122-126]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
624	Taibe			pre-1400 AD	Low	qanat 2				Qanat al Jubeib Source might be between tell and S cemetery [Kobori *et al.* 1980, 59-61]
624	Taibe			pre-1400 AD	Low	qanat 3				Qanat al-Qdeir Might be open channel and not qanat [Kobori *et al.* 1980, 61]
624	Taibe			pre-1400 AD	Low	qanat 4	200.00			Old Qanat al-Kebir Repeated cave-ins of ceiling mean that this is now used as an open channel [Kobori *et al.* 1980, 61]
624	Taibe			pre-1400 AD	Low	qanat 5	100.00			Qanat al Jubeib-Shahab A few simple shafts found [Kobori *et al.* 1980, 61]
624	Taibe			pre-1400 AD	Low	qanat 6				Qanat al Abdul Aziz Source under Jebel ash-Sheikh Ibrahim NW of Taibe Masonry shafts Construction similar to main qanat. Tunnel walls: ashlar and two plate stones used for ceilings as principal rafter design [Kobori *et al.* 1980, 61f]
616	Udhruh	Jordan		Late Roman or Nabataen	Low	qanat				Spoil heaps only visible 3 tunnels with lines of shafts join under modern road and seem to lead towards Nabataean reservoir to E [Killick 1987, 28]
616	Udhruh			Late Roman or Nabataen	Low	reservoir				Possibly fed by qanat system Might be Nabataean [Killick 1987, 28]
652	Yotvata oasis	Israel	sandstone	Persian, Roman, Late Roman or Early Arab	Low	qanat 1	5000.00			One of 5 qanat systems in souther Arava valley close to Yotvata spring and salt pan Longest system (system A) [Ron 1989, 216]
652	Yotvata oasis			Persian, Roman, Late Roman or Early Arab	Low	qanat 2				[Ron 1989, 216]
652	Yotvata oasis			Persian, Roman, Late Roman or Early Arab	Low	qanat 3				System C C1 has 11 shafts Mother well 6 m to groundwater Tunnel originally lined with stone to prevent collapse C2 has 10 shafts at c 10 m intervals Bypass section of several shafts in 50 m long crescent shape beside mother well built to oversome collapse [Ron 1989, 216] [Evenari *et al.* 1982, 175]
652	Yotvata oasis			Persian, Roman, Late Roman or Early Arab	Low	qanat 4				[Ron 1989, 216]

Site No.	Name	Location	Geology	Date	Dating Confidence	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments
652	Yotvata oasis			Persian, Roman, Late Roman or Early Arab	Low	qanat 5				[Ron 1989, 216]

Gazetteer 4: Floodwater irrigation systems

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
654	Abu Gosh	pre 70 AD	Low		spring	spring flow tunnel	10.50	0.45	Excavated cave with tunnel leading out of it to an external pool Roof ceiled with stone slabs [Ron 1966, 113] NB however that de Vaux and Steve 1950 think that the tunnel is later Minimum height of tunnel = 1.3 m [Ron 1985, 168]
654	Abu Gosh					pool			External pool fed by spring flow tunnel [Ron 1966, 113]
654	Abu Gosh					reservoir			Built over earlier spring flow tunnel Prevents tunnel flowing to pool and opens out roof of excavated cave [Ron 1966, 113] Has inscription [Ron 1985, 168]
674	Auara	Nabataean	Low		run-off	terrace			Found on six sites [Oleson 1991, 49-50]
674	Auara					teleilat al-einab			One field, cleared of stones by heaping them in orderly rows of piles [Oleson 1991, 50]
671	Diyateh	Diocletianic	High	basalt	Wadi	dam			300 km downstream of village on wadi bed Directs water into channel Regulator [Sadler 1990, 428-9]
671	Diyateh					channel 1			Principal channel. Leaves dam and feeds two other channels [Sadler 1990, 429]
671	Diyateh					channel 2			One of two irrigation channels fed by channel 1 Several outlets feed water into fields along its course 0.5 - 1 m wide x 0.2-0.5 m deep [Sadler 1990, 429-430]
671	Diyateh					channel 3	3000		One of two irrigation channels fed by channel 1 Feeds a larger area Also has subsidiary offtake channels, some 800 m long [Sadler 1990, 430-431]
671	Diyateh				Run off	terrace walls			In valley further N which cannot be irrigated by channels from dam because of altitude [Sadler 1990, 433-4]
644	Horbat Kohal	Late Roman	Low		Wadi	Check dam			Six terraced courses of large stones 4.5 m sq agricultural plot created behind dam Earth with stone facing embankments built perpendicular to flow opposite agricultural terraces [Negev 1999, 88*]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
644	Horbat Kohal					dam 2	50.00		One course high Extends over 'island' within wadi bed along almost entire length [Negev 1999, 88*]
633	Jabal Harun	Nabataean or late Roman	Medium	limestone	Wadi	wadi walls			Sites C-L Variations of tributary and main wadi cultivation combined with slope terracing Considerable concentrations (up to 5 m) of fine alluvial deposits in small, artificial fields created by wadi terrace walls Site C includes at least 24 wadi terrace walls. Smaller tributaries of wadi al Farasha at site C contain barrages, one has at least 6 [Frosen *et al.* 1998, 497] [Lavento and Huotari 2002, 93]
633	Jabal Harun					terrace walls			Sites P-S Predominantly slope terracing [Frosen *et al.* 1998, 497]
633	Jabal Harun					barrage			Site 33e Has a step-like installation (3.15 x 2.92 x 1.92 m) running perpendicularly through the barrage - possibly functioned as water channel controlling and slowing down flow of water over barrage Higher barrier wall runs perpendicular to main barrage. [Frosen 1999, 397f, fig. 16]
646	Jerusalem (Ya-ar Ramot)	3rd-5th century AD	Medium		Wadi	Check dam			Comprises two walls perpendicular to each other W101: NW-SE: 10 m long x 1.3 m wide: large roughly hewn stones W100: NE-SW: c 6 m long x 2 m wide: wadi pebbles bonded by mud [Rapuano 1999, 74*-75*]
656	Kanata	104-108 AD	Very high	basalt		Channel 1			From Suweida [Dunand 1930, 276]
656	Kanata	104-108 AD	Very high	basalt		Channel 2			From Raha [Dunand 1930, 276]
656	Kanata	104-108 AD	Very high	basalt		Channel 3			From Al Afina [Dunand 1930, 276]
637	Khirbat Abu an-Nasur	Late Roman	Medium		run-off	walls			Stone terrace walls used to collect run-off water Not clear if used for irrigation or domestic use [Waheeb 1996, 345]
668	Kurnub	Nabataean, Roman or late Roman	Low	limestone	run-off	wadi walls			Stabilizing structures when wadi was shallow depression [Evenari *et al.* 1982, 112]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
668	Kurnub					diversion system			Runoff water now in wadi 1-2 m below level of floodplain Diversion system to lead water to terraces Channel is 9-5 m wide, 400 m long Led water to series of broad terraced fields Excess water flowed from terrace to terrace via drop structures [Evenari *et al.* 1982, 110-112, fig. 74]
668	Kurnub					runoff farm			Diversion channel filled with silt Conversion of lower section of diversion system into runoff farm. Standard runoff conduits used. Small diversion dams diverted additional runoff from small wadis into conduits [Evenari *et al.* 1982, 113-114]
645	Laqiya-Nahal Rosh	Late Roman	Low			dam 1			One of two dams on Nahal Ramon. Probably formed part of dam network built in the late Roman period in the drainage basin of Nahal Be'er Sheva [Katz 1999, 87*]
645	Laqiya-Nahal Rosh					dam 2			Probably formed part of dam network built in the late Roman period in the drainage basin of Nahal Be'er Sheva [Katz 1999, 87*]
642	Nahal Hevron	Late Roman	Medium		Wadi	dam 1			[Negev 1996, 128 fig. 141]
642	Nahal Hevron					dam 2			S bank of wadi Foundations not anchored in bedrock Possibly connected with a diversionary channel, reservoir and path Not used with other dams? [Negev 1996, 129, fig. 142]
642	Nahal Hevron					dam 3	30.00		Similar to dam 1 Runs parallel to N bank of wadi, but when in use stood perpendicular to course of current [Negev 1996, 129, fig. 143]
642	Nahal Hevron					dam 4			Only scanty remains Remains on both sides of wadi [Negev 1996, 129, fig. 144]
642	Nahal Hevron					dam 5			Dam front: large river cobble courses based on courses of smaller cobbles placed with narrow side parallel to the current Reservoir uses dam as E wall Diversionary channel also visible Repaired repeatedly in modern times [Negev 1996, 129, fig. 145]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
642	Nahal Hevron					reservoir	5.00	0.80	Associated with dam 5; uses dam as E wall Projects into stream bed Traces of plaster identified [Negev 1996, 129]
642	Nahal Hevron					channel			Diversionary channel associated with dam 5 Traces of plaster identified Channel ran at fairly high level so water only flowed when sufficient water collected behind dam [Negev 1996, 129]
642	Nahal Hevron					dam 6			Located at 90 deg bend in stream bed Much alluvial soil heaped up behind it Fragment in middle of stream bed may be later than other parts of dam [Negev 1996, 130, fig. 146]
642	Nahal Hevron					dam 7			Buttress dam standing at right angles to flow of stream Building method is similar to dams 1, 3 and 5 Dam seems to have been entirely plastered Associated with a reservoir [Negev 1996, 131, fig. 147]
642	Nahal Hevron					reservoir			Associated with dam 7 [Negev 1996, 131]
636	Nakhl	Nabataean	Low	limestone and chert	Wadi	Check dams		4.00	Low-lying Built to store water usually filling highest dam first and then allowing overflow to fill next lower dam downstream Constructed perpendicularly across the wadi [Mattingly *et al.* 1998, 332, 334, fig. 2]
636	Nakhl					walls			Constructed in catchment area to retain moisture for crops or animal use Constructed perpendicular to the dams dividing the area into smaller sections that may have been pools or reservoirs [Mattingly *et al.* 1998, 332, 334, fig. 2]
636	Nakhl					cisterns			3; possibly not associated with irrigation, but settlement [Mattingly *et al.* 1998, 332 fig. 2]
664	Nessana area					wall			Last wall in Wadi Abda with rectangular openings at base [Mayerson 1960a, 28]
664	Nessana area					spillway			Wadi Um Tayran Through anti-scour wall [Mayerson 1960a, 34]
664	Nessana area					dam			Wadi Auja Curves towards the left bank where a channel led water into terraced fields [Mayerson 1960a, 34]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
664	Nessana area					dam 2			Further up Wadi Auja Up to 1.8 m wide Near end of dam before it curves into left bank is a spillway [Mayerson 1960a, 34]
664	Nessana area					channels		0.30	Cut into floor of tunnel Plastered [Gibson and Edelstein 1985, 143]
664	Nessana area					chamber	3.40	2.20	Built in front of tunnel Has square manhole in ceiling Provides easy access to tunnel for cleaning [Gibson and Edelstein 1985, 143]
664	Nessana area					channel			Leads out of chamber to N Set into a stone built gallery Plastered [Gibson and Edelstein 1985, 143]
664	Nessana area					reservoir			Fed by galleried channel 4000 m3 Seems to have ancient foundations, but has subject to much restoration particularly in 19th century. [Gibson and Edelstein 1985, 143]
664	Nessana area					channel			Plastered irrigation channel ran at base of each terrace Controlled by a valve system which allowed for regulated distribution of water Possibly later insertions [Gibson and Edelstein 1985, 143]
647	Qadesh Barnea	Late Roman	Medium		Wadi	Check dams			Terrace wadi beds and are sometimes connected to settlements by long stone fences that enclose parts of the wadi [Heimann 1984, 90]
660	Qasr Feifeh	Nabataean	Medium			walls			Terraced fields [Glueck 1959, 202]
667	Ramliye	AD 88-89	High			diversion system			Dam dated by an inscription [Evenari *et al.* 1982, 119]
630	Rosh Ha'ayyin					channel			Fenced in [Berda 2000, 99*]
630	Rosh Ha'ayyin	Late Roman or Early Islamic	Medium		Wadi	Check dams			Across wadi Built from one or two rows of stones [Berda 2000, 99*]
663	Ruheibeh	Late Roman	Medium		run-off	walls			Low terrace walls in Wadi Ruheibeh [Glueck 1959, 261]
648	Sbeiteh (Shivta)	Late Roman	Medium	marl and chalk	wadi and run-off	field system			In Lavan Valley Category 2 (see notes) Built on two main levels Upper level: obtains water from run-off gully and is laid out at same height as alluvial fan; divided into 8 sub plots; total 30 dunams (500 dunams = 42 hectares) Lower level: 80 dunams: obtain water from wadi itself which is tapped 700 m upstream in 3 channels [Kedar 1957, 182-183]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
648	Sbeiteh (Shivta)					channel 1			Right-hand channel Supplied water to upper 23.5 dunams of lower level [Kedar 1957, 183]
648	Sbeiteh (Shivta)					channel 2			Central channel Supplied middle 36 dunams of lower level [Kedar 1957, 183]
648	Sbeiteh (Shivta)					channel 3			Left-hand channel, closest to wadi bed Supplied water to lowest 19.5 dunams of lower level [Kedar 1957, 183]
648	Sbeiteh (Shivta)					spillways			Served as drop structures to carry water from upper terrace to lower 3 categories Type 1 1. Crest lengths of 30-60 m, handle flows of 10-30 m3 per sec Unconnected to stone walls Stage I development [Evenari *et al.* 1982, 114-118]
648	Sbeiteh (Shivta)					spillways			Served as drop structures to carry water from upper terrace to lower Type 2 2. Crest length of 3-8 m, handle flows of 1-5 m3 per sec Belong to diversion systems where only part of flood utilized Stage II [Evenari *et al.* 1982, 114-118]
648	Sbeiteh (Shivta)					spillways			Served as drop structures to carry water from upper terrace to lower Type 3 3. Small up to 1 m wide, flows of less than 1m3 per sec Stage III where runoff farms superimposed on diversion systems [Evenari *et al.* 1982, 114-118]
648	Sbeiteh (Shivta)					channel 4	2500		Part of a separate system Diverts water from Qorhah basin into the Shivtah area (Zeithan Valley) Double water resources from Zeithan Valley [Kedar 1957, 184]
662	Site 367	Nabataean	Low			walled hilltop			Serves as major catchment area [Glueck 1959, 221]
662	Site 367					terraces			In the wadis [Glueck 1959, 221]
662	Site 367					channels			Interconnecting channels leading from top to bottom [presumably of the wadis?] [Glueck 1959, 221]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
658	Sumaqa	late Roman	High	limestone		terrace walls			In areas 33 and 34 Some of the terraces are 90 m+ long Width of terrace surface varied between 5-17 m W2 was particularly wide at 3.62 m: stop pressure of run-off water and enable extra water to flow onwards In area 34 most terraces 10-20 m long [Dar 1999, 118-124]
658	Sumaqa					reservoir 1			MR 1539/2303 400 m S of settlement at edge of Sumaqa valley Reservoir drained water from valley to E of Mt Sumaq [Dar 1999, 125]
658	Sumaqa					reservoir 2			MR 1548/2304 SE of settlement Drains an E-W oriented valley [Dar 1999, 125]
658	Sumaqa					reservoir 3	50.00	60.00	MR 1551/2304 Area 35: has terraced valley as well as 2 reservoirs [Dar 1999, 125] Large reservoir to SW of Bir Abd el-Ghani 4-5,000 m3 Built where gorge widened in low saddle-like zone 2 large embankments to N and S 8 m long wall built along width of reservoir in centre [Dar 1999, 133f, fig. 90, pl. 187-9]
658	Sumaqa					reservoir 4			MR 1551/2304 Area 35: has terraced valley as well as 2 reservoirs Smaller and badly preserved [Dar 1999, 125, 133]
658	Sumaqa					reservoir 5			MR 1552/2299 Continuation of S section of valley in area 35 Vestiges of additional reservoir noted [Dar 1999, 125]
658	Sumaqa					water tank/cistern	15.90	8.90	Located 80 m to W of road Drains run-off water from valley Fed by 2 collecting channels 60-80 m long Has settling tank to E Two square openings (0.5 x 0.55 m) in barrel-vaulted ceiling for drawing water Interior plastered with op sig. Part rock-cut, part built After tank to W valley is blocked by dams [Dar 1999, 125f, pl. 180- 183, fig. 88]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
658	Sumaqa					Check dam	28.00	2.00	Check dam 14 in valley area 35 Central section built on soil Sides only keyed into bedrock One of 18 such dams in the valley to stop inundation of rainwater and cause water to enter ground Overflow > roofless reservoir c. 1.5 m depth of soil accumulation Create area of 15 dunams (3.75 acres) for cultivation along edge of dams [Dar 1999, 127-133, fig. 89, pl. 184]
631	Tel Ashdod	late Roman	Medium		well	channel			Feeds agricultural plots Water provided by saqiya wheel [Baumgarten 1999, 66*]
632	Umm al-Jimal	Nabataean or Roman	Medium	basalt	Wadi	field system			Numerous terrace walls, dams and channels indicate intense agricultural activity near wadi at centre of gently sloping valley. [De Vries 1993, 437]
634	Umm Ratam	Nabataean, Roman or late Roman	Medium		run-off	check dams			Get higher towards the W [Lindner *et al.* 2000, 553]
628	Wadi Faynan	Nabataean and Roman	High			field walls			WF4.6 and WF4.10/WF4.15 Both systems took water from one of four minor gullies running down terrace slope and redistributed it through series of walled channels to areas downstream [Barker *et al.* 1997, 31]
628	Wadi Faynan					field walls			WF4.3 Walls running obliquely in herring-bone pattern down mountain sides trapped overflow and gully flow and led water to fields below [Barker *et al.* 1997, 31-32]
628	Wadi Faynan					field walls			WF4.3 Water sent down long meandering channel formed of parallel walls running NW down spine of fan Small sluices, several with baffles allow water into upper fields Channel ends downslope where junction was constructed to channel water W, NW and N [Barker *et al.* 1998, 15-16]
628	Wadi Faynan					field walls			WF4.4 Single substantial barrage diverts water with variety of sluices and baffles spaced at intervals along it to feed water into fields below [Barker *et al.* 1998, 16]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
628	Wadi Faynan					field walls			WF4: northern area Walls immediately parallel to wadis presumably to prevent water and sediment escaping system into main wadi flow for as long as possible [Barker *et al.* 1998, 16]
628	Wadi Faynan					field walls			WF4.1, 4.2, 4.3 Series of parallel-wall systems constructed to divert water from lower sections of the tributary wadis before it reached wadi Faynan [Barker *et al.* 1998]
628	Wadi Faynan					field walls			WF4.2 Water from tailrace of mil diverted via perimeter wall around fields WF4.1, 2, 3, 4, 5 and 13 before discharging into main wadi via artificial channel because not suitable for agricultural usage [Barker *et al.* 1999, 277]
628	Wadi Faynan					field walls			WF4.6 and 7 Parallel wall systems Trenches revealed traces of a clay lining 2 trenches exhibited various phases of construction and re-lining Also subterranean structures found indicating well-built structures Roman pottery found within construction and sedimentation contexts OSL samples also taken [Barker *et al.* 2000, 43-4]
657	Wadi Mshash area	Roman or late Roman	Medium		Wadi	wadi walls			Built at frequent intervals across the wadis in this area to catch the soil and prevent erosion. Modern Arab cultivators try to imitate them, but say their light dry-stone walls are easily carried away in the torrents Terrace walls come to an end a few km E of Kurnub [Kirk 1938, 214, 224]
661	Wadi Raviv	Nabataean	Medium			walls			In Wadi Raviv which connects Subeita to Nessana [Glueck 1959, 215]
661	Wadi Raviv					dams			[Glueck 1959, 215]
661	Wadi Raviv					channels			Deflecting channels [Glueck 1959, 215]
661	Wadi Raviv					spillways			[Glueck 1959, 215]
661	Wadi Raviv					cisterns			[Glueck 1959, 215]
643	Zikhron Ya'aqov (Kh Jabir)	Roman	High		Wadi	wall 1		1.30	Retaining wall for agricultural terrace 41 Extend across wadi in E-W direction Lowest of three: only 2 courses high Medium-sized fieldstones Placed directly on brown soil [Yavor 1998, 42]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
643	Zikhron Ya'aqov (Kh Jabir)					wall 2		3.20	Retaining wall for agricultural terrace 42 Extend across wadi in E-W direction Medium-sized fieldstones Based on rock [Yavor 1998, 42]
643	Zikhron Ya'aqov (Kh Jabir)					wall 3		1.50	Retaining wall for agricultural terrace 43 Extend across wadi in E-W direction Large fieldstones laid on bedrock [Yavor 1998, 42]

Gazetteer 5: Cistern-fed garden irrigation systems

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
709	Chariton	Late Roman	High			Cistern			Overflow form monastery feeds garden [Hirschfeld 1992, 153]
707	Khirbet ad-Deir	Late Roman	High			Cistern			Overflow from monastery feeds garden [Hirschfeld 1992, 153]
707	Khirbet ad-Deir					reservoir			Provides water and soil for gardens [Hirschfeld 1992, 159]
708	Monastery of St Euthymius	Late Roman	High			Reservoir 1			2 spouts 60 m east of monastery [Hirschfeld 1992, 200]
708	Monastery of St Euthymius					Reservoir 2			[Hirschfeld 1992, 200]
708	Monastery of St Euthymius					Cistern			[Hirschfeld 1992, 200]
629	Monastery of St Martyrius/ Ma'ale Adummin	Late Roman	High			upper garden			SE corner of monastery L-shaped with cistern, pool and aqueduct 2.5 dunams [Damati 2002, 438]
629	Monastery of St Martyrius/ Ma'ale Adummin					cistern			In upper garden Apparently 2,000 m^3 [Damati 2002, 438]
629	Monastery of St Martyrius/ Ma'ale Adummin					pool	1.50	1.20	In upper garden to S of cistern Elevated water level Feeds two stone aqueduct channels [Damati 2002, 438, fig. 2]
629	Monastery of St Martyrius/ Ma'ale Adummin					aqueduct			Two in upper garden Departed from pool and directed water to two levels of garden [Damati 2002, 438]
629	Monastery of St Martyrius/ Ma'ale Adummin					southern garden			Largest of three 7.5 dunams 2 large cisterns No pools Aqueduct channels [Damati 2002, 438-9]
629	Monastery of St Martyrius/ Ma'ale Adummin					cisterns			2 in southern garden Received runoff from long W hill Apparently 15,000 m^3 [Damati 2002, 438]
629	Monastery of St Martyrius/ Ma'ale Adummin					channels			In southern garden Presumably ran from cisterns No pools needed to elevate water because of relatively steep gradient of aqueducts Some segments found in situ Holes for water to emerge spaced at 1.5 m intervals [Damati 2002, 438-9]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Comments
629	Monastery of St Martyrius/ Ma'ale Adummin					eastern garden			Best preserved and surrounded by massive masonry wall 1 dunam with three irregular terraces Cistern, 3 pools and conduits Possibly several phases of irrigation works [Damati 2002, 439-442, fig. 3]
629	Monastery of St Martyrius/ Ma'ale Adummin					cistern			In eastern garden Received water from two aqueducts that brought run-off from ridge Apparently 15000 m^3 [Damati 2002, 440]
629	Monastery of St Martyrius/ Ma'ale Adummin					pool 1	2.40	1.80	One of three in eastern garden, each irrigating separate terrace Uncut mortared stones plastered on both sides Several plaster layers inside Water ran from pool through lead pipe in E wall at bottom into square stone basins and then into irrigation channels. [Damati 2002, 440-1]
629	Monastery of St Martyrius/ Ma'ale Adummin					pool 2	1.50	1.00	One of three in eastern garden, each irrigating separate terrace Uncut mortared stones plastered on both sides Several plaster layers inside Water emerged at two levels Water ran from pool through lead pipe in E wall at bottom into square stone basins and then into irrigation channels At higher level emerged above S wall [Damati 2002, 440-1]
629	Monastery of St Martyrius/ Ma'ale Adummin					basin	0.40	0.30	In E garden associated with pool 2 Hole in E side for water to flow into irrigation channel [Damati 2002, 441]
629	Monastery of St Martyrius/ Ma'ale Adummin					pool 3	2.80	2.20	One of three in eastern garden, each irrigating separate terrace Largest capacity c. 8 m3 Uncut mortared stones plastered on both sides Several plaster layers inside Water ran from pool through lead pipe in E wall at bottom into square stone basins and then into irrigation channels [Damati 2002, 440-1]
629	Monastery of St Martyrius/ Ma'ale Adummin					basin 2			In E garden associated with pool 3. Water passes from here to 2 long conduits [Damati 2002, 441]
629	Monastery of St Martyrius/ Ma'ale Adummin					irrigation conduits			In E garden 8 identified Typically have narrow channel 0.15 m wide x 0.1 m deep Sides and top well-cut, lower part left rough Apertures cut at 1.5 m intervals for water to irrigate garden [Damati 2002, 441, fig. 5]

Gazetteer 6: Spring-fed irrigation systems

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Depth (m)	Comments
654	Abu Gosh	Pre-70 AD	Low		spring	tunnel				[Ron 1966, 113]
654	Abu Gosh					'pool'				Fed by spring flow tunnel [Ron 1966, 113]
654	Abu Gosh					reservoir				Built over spring flow tunnel [Ron 1966, 113]
659	At-Telah	Nabataean or Roman	Low		spring	reservoir				Fed by spring waters [Glueck 1959, 201] [Newson 2002, 244]
659	At-Telah					walls				Create fields irrigated by reservoir water [Glueck 1959, 201-2]
666	Ein Yalu	1st century BC – Late Roman	Medium			tunnel				Cut horizontally into slope of hill Branching channels are set into flow of tunnel [Gibson and Edelstein 1985, 143]
50	Emmaus	late Roman	Medium		Ma'ayan HaTemerim spring	'Pool'	2.2	2.2		At end of tunnel [Patrich and Amit 2002, 17; Hirschfeld 2002a]
50	Emmaus					Channel	16			Channel between pool and reservoir [Patrich and Amit 2002, 17; Hirschfeld 2002a]
50	Emmaus					Reservoir	5	5	1.2	Lined reservoir at end of channel [Patrich and Amit 2002, 17; Hirschfeld 2002a]
50	Emmaus					Tunnel				Cut horizontally into water table [Patrich and Amit 2002, 17; Hirscfeld 2002a]
78	En Boqeq	Herodian	High		En No'it spring	Channel		0.12	0.2	U-shaped blocks [Patrich and Amit 2002, 17; Porath 2002a, 34; Fischer and Shacham 2002, 406-408]
78	En Boqeq					Tower	10.5	9		Regulating tower splits channel into four [Patrich and Amit 2002, 17; Porath 2002a, 34; Fischer and Shacham 2002, 406-408]
78	En Boqeq					Channel	11			From tower to fields [Patrich and Amit 2002, 17; Porath 2002a, 34; Fischer and Shacham 2002, 406-408]

Site No	Site Name	Date	Dating Reliability	Geology	Source	Element	Length (m)	Width (m)	Depth (m)	Comments
78	En Boqeq					Spring house	3.82	3.6		Possible spring house at beginning of system [Patrich and Amit 2002, 17; Porath 2002a, 34; Fischer and Shacham 2002, 406-408]
641	En Gedi	1st-3rd century AD with later phase	Medium to high		spring	terraces				In fields extending over about 10 dunams [Ofer and Porath 1986, 28]
641	En Gedi					reservoir 1				No 11 One layer of light grey plaster [Ofer and Porath 1986, 28]
641	En Gedi					reservoir 2				No 18 Near spring Covered with three layers of lime plaster [Ofer and Porath 1986, 28-29]
17	Nahal Zippori	Late Roman	Medium		Yifta'el springs	Channel	59 +	0.42	0.93	At least 59 m long. Runs parallel to Nahal Zippori river. Roofed with long low fieldstones Lined with beaten earth probably mixed with lime and plaster. [Syon 1994, 46-49]
28	Wadi al-Nazazat				Al Bustan spring	Channel				Rock-cut channel before bridge; built afterwards [Amit 2002a, 174-5]
28	Wadi al-Nazazat					Bridge	17	1.75	3	Across ravine [Amit 2002a, 174-5]

Gazetteer 7: Aqueducts

7.1: Aqueducts ordered alphabetically

Site no	Site Name	Aqueduct Type	Purpose Or Destination	Date	Confidence	Reference
672	Abila - upper	Urban	Urban supply	Pre-AD 568	High	Schumacher 1889, 23f, 49; Mare 1984, 48; Mare 1985, 228f; Mare 1995, Fuller 1986, 270-276.
672	Abila – lower	Urban	Urban supply	Pre-AD 568	High	Schumacher 1889, 23f, 49; Mare 1984, 48; Mare 1985, 228f; Mare 1995, Fuller 1986, 270-276.
33	Acco	Urban	Urban supply	Hellenistic (late 4th-early 3rd BC)	High	Frankel 2002; Patrich and Amit 2002, 17; Peleg 1991a.
154	Ain Remeileh	Rural	Cistern			Kirkbride and Harding 1947, 13.
158	Ain Shellaleh	Rural	Reservoir	Nabataean	High	Sauvignac 1932, 585; Sauvignac 1933, 407; Sauvignac 1934, 581, pl. 35.
144	Al Basiri	Rural				Musil 1928, 128.
21	Aleppo	Urban	Urban supply			Mazloum 1936.
64	Alexandrion/Sartaba - lower/Ras Kunetra	Rural	Agriculture, fortress, cistern	Hasmonean or Herodian	High	Patrich and Amit 2002. 17; Amit 2002c, 307-310; Garbrecht and Peleg 1994, 168.
65	Alexandrion/Sartaba - middle	Rural	Cistern	Hasmonean or Herodian	High	Patrich and Amit 2002, 17; Amit 2002c, 310.
66	Alexandrion/Sartaba - upper	Rural	Cistern	Hasmonean or Herodian	High	Patrich and Amit 2002, 17; Amit 2002c, 310f.
40	Antioch - acropolis	Urban	Baths; settlement	Julius Caesar	Medium	Wilber 1938, n. 6; Downey 1951.
37	Antioch - mountain	Urban	Urban supply	2nd century BC	High	Downey 1951.
39	Antioch - north & central	Urban	Urban supply	Caligula	Medium	Wilber 1938; Lassus 1983, 211; Downey 1951.
22	Antioch - south	Urban	Reservoir	Trajanic or Hadrianic	High	Wilber 1938; Downey 1938; Lassus 1983; Sinclair 1990, 251; Downey 1951; Downey 1961, 437, 439.
23	Apamea	Urban	Urban supply	2nd century AD	High	Shahada 1957; Balty 1987, 16-22.
737	Ashqelon	Urban	Urban supply	Herodian	High	Josephus *BJ* 1.21.11.
84	Auara	Rural	Reservoir, baths, irrigation	Nabataean	High	Oleson 1991; Eadie and Oleson 1986; Eadie 1984, 217; Oleson 1986; Glueck 1935, 65.
43	Banias	Urban	Urban supply	1st century AD	High	Hartal 2002; Patrich and Amit 2002, 17; Conder and Kitchener 1883, 110; Hartal 1993, 1-2; Hartal 1996, 5-7.
547	Beirut	Urban	Urban supply, mill			Davie *et al.* 1997.
44	Beth Govrin - east	Urban	Urban supply	Early 3rd century AD	High	Patrich and Amit 2002, 17.
45	Beth Govrin - north	Urban	Baths, agriculture	Early 3rd century AD	High	Sagiv, Zissu and Amit 2002; MacAlister 1901; Patrich and Amit 2002, 17; Hedges *et al.* 1996, 197.
16	Binyaminas	Rural				Hirschfeld 2000, 301.

Site no	Site Name	Aqueduct Type	Purpose Or Destination	Date	Confidence	Reference
118	Birket al Bakbuk, Tyre	Rural	Reservoir			Conder and Kitchener 1881, 56.
120	Birket Ali ad Dhaher	Rural	Irrigation? Rural settlement?	Roman	Medium	Conder and Kitchener 1881, 382-3.
88	Bosana (Bousan)	Rural		Pre-365 AD	High	Di Segni 2002, 54, n. 101.
678	Bosra	Urban	Reservoir	Roman	High	*IGLS* 13.1, 9128-37.
34	Caesarea - High Level Channel A	Urban	Urban supply	Channel A (E): Herodian; continued in use post-Hadrian	Medium	Porath 2002a, 28; Porath 2002b, 105-117; Conder and Kitchener 1882 II, 22-23; Siegelmann 2002, 134-5; Patrich and Amit 2002, 17; Negev 1964; Peleg 1991a; Everman 1992, 183; Porath and Yankelevitz 1989-1990, 130-131.
34	Caesarea - High Level Channel B	Urban	Urban supply	Channel B (W): Hadrianic Channel C (triple pipeline): replaces channel B, therefore post-Hadrianic	High	Porath 2002a, 28; Porath 2002b, 105-117; Conder and Kitchener 1882 II, 22-23; Siegelmann 2002, 134-5; Patrich and Amit 2002, 17; Negev 1964; Peleg 1991a; Everman 1992, 183; Porath and Yankelevitz 1989-1990, 130-131.
41	Caesarea - low level	Urban	Urban supply	TAQ 385 AD	High	Porath 2002a, 28; Porath 2002b, 117-119; Patrich and Amit 2002, 17; Everman 1992.
35	Caesarea - southern line	Pipeline		3rd to 6th century AD	High	Patrich and Amit 2002, 17; Peleg 1991a.
312	Capitolias	Urban	Urban reservoir	Roman or late Roman	Medium	Tsuk 2002a, 293; Harding 1967, 56; Schumacher and Le Strange 1890, 162-166.
100	Chariton	Rural	Reservoir	5th century AD	High	Hirschfeld 2002c.
94	Cypros	Pipeline	Mill, Aqueduct, reservoir	Late Roman	Medium	Meshel and Amit 2002, 322-329
95	Cypros - 'local'	Rural	Agriculture, settlement	End 2nd century AD	High	Meshel and Amit 2002.
68	Cypros - long/lower	Rural	Fortress, irrigation	Herodian	High	Patrich and Amit 2002, 17; Meshel and Amit 2002; Garbrecht and Peleg 1994, 167; Conder and Kitchener 1883, 227.
67	Cypros - short/upper	Rural	Fortress	Hasmonean	High	Patrich and Amit 2002, 17; Meshel and Amit 2002.
141	Damascus	Urban	Urban supply	Roman	High	Naval Intelligence Division 1920, 418.
38	Daphne	(Sub)urban	Gardens			Lassus 1983, 210.
69	Dok/Dagon	Rural	Cistern	Hasmonean	High	Patrich and Amit 2002, 17; Amit 2002d.
46	Dor - eastern	Urban	Industrial, urban supply	Early 2nd century	High	Peleg 2002b, 149-153; Berg, Sharon and Zilberstein 2002, 159-61; Patrich and Amit 2002, 17.
47	Dor - southern	Urban	Urban supply	Late Roman	High	Patrich and Amit 2002, 17.
20	Edessa	Urban	Flood protection	Justinianic	High	Segal 1970, 186-87.
131	El Hummam	Rural	Irrigation?; settlement?			Conder and Kitchener 1882, 237.

Site no	Site Name	Aqueduct Type	Purpose Or Destination	Date	Confidence	Reference
49	Emmaus - lower	Urban	Urban supply	4th - 5th century AD	High	Hirschfeld 2002a, 191-195; Patrich and Amit 2002, 17; Hirschfeld 1978.
48	Emmaus - main/upper	Urban	Urban supply	2nd-3rd century AD	High	Hirschfeld 2002a, 187-191; Patrich and Amit 2002, 17.
90	Emmaus - side	Urban	Urban supply			Hirschfeld 2002a, 194.
13	En Boqeq - south	Rural	Reservoir	Herodian	High	Patrich and Amit 2002, 17; Porath 2002a, 34; Fischer and Shacham 2002, 403-406; Gichon 1993, 60-61, 398-99.
32	Hamat Gader	Pipeline	Baths	Pre-7th century AD	High	Peleg 1991a, 134-5.
161	Harbaqa	Urban	Urban supply			Personal observation.
27	Herodion	Urban	Gardens; settlement	Herodian	High	Porath 2002a, 29; Mazar 2002b, 2434; Amit 2002b, 256-261; Amit 1994, 572.
122	Homs	Urban	Gardens, Urban supply	3rd century AD	High	Conder 1883, 39 and 41; Calvet and Geyer 1992a, 32; Seyrg 1959, 189.
71	Hyrcania - longer/upper/southern	Rural	Cistern	Herodian	High	Patrich and Amit 2002, 17; Patrich 2002; Garbrecht and Peleg 1994, 168.
70	Hyrcania - short/lower/northern	Rural	Cistern	Hasmonean	Medium	Patrich and Amit 2002, 17; Patrich 2002.
126	Iskenderuneh	Rural				Conder and Kitchener 1881, 176.
147	Jerash	Urban	Reservoir	By AD 125-7	High	Irby and Mangles 1845, 97.
75	Jericho palaces - N	Aqueduct	Irrigation, settlement	Hasmonean	High	Patrich and Amit 2002, 17; Glueck 1951, 404-9, pls/figs 126, 127; Conder and Kitchener 1883, 206; Dauphin 1984a, 35.
76	Jericho palaces - N extension	Aqueduct		Herodian	High	Patrich and Amit 2002, 17; Conder and Kitchener 1883, 206.
74	Jericho palaces - SW	Aqueduct	Gardens	Hasmonean or Herodian	High	Patrich and Amit 2002, 17; netzer and Garbrecht 2002, 367-372; Conder and Kitchener 1883, 205.
56	Jerusalem - 'Arrub	Urban	Urban supply	Pontius Pilate	High	Mazar 2002a, 213-217; Patrich and Amit 2002, 17.
55	Jerusalem - Biyar	Urban	Urban supply	Herodian	Medium	Patrich and Amit 2002, 17; Mazar 2002a; Amit 2002b.
54	Jerusalem - Low	Urban	Urban supply	Hasmonean	High	Mazar 2002a, 217-223; Billig 2002; Patrich and Amit 2002, 17; Nadelman 2000.
29	Jerusalem- High Level	Urban	Urban supply	Herodian, inverted siphon probably added in 2nd century AD	Medium	Mazar 2002a, 227-230; Amit 2002b, 253-256; Patrich and Amit 2002, 17; Peleg 1991a, 130-1; Maeir 1993, 62.
86	Kanata (Kerak)	Urban		104-108 AD	High	Waddington 2296; *SEG* VII, 969, 977-9.
128	Kh at Tahuneh	Rural				Conder and Kitchener 1881, 247.
127	Kh Muaddemiyeh	Rural				Conder and Kitchener 1881, 242.

Site no	Site Name	Aqueduct Type	Purpose Or Destination	Date	Confidence	Reference
113	Khan al-Manqoura	Rural	Reservoir	Roman	High	Poidebard 1934, 46; pls 21-25; Musil 1928, 32.
101	Khirbet ad-Deir	Rural	Cistern, agriculture			Hirschfeld *et al.* 1999, 88-9.
12	Khirbet ad-Deir - upper	Rural	Cistern			Hirschfeld 1999, 87-8.
138	Khirbet al Gharbeh	Rural	Reservoir	Late Roman	High	Abel 1932, 88.
106	Khirbet Ayun Ghuzlan	Rural	Irrigation, settlement	Nabataean	Medium	Glueck 1937-1939, 57; MacDonald 1980, 178.
132	Khirbet Mird	Rural	Reservoir	Late Roman	Low	Conder and Kitchener 1883, 212.
99	Khirbet Urmeh-Aqraba	Rural	Cistern	Hasmonean	High	Eshel and Erlich 2002.
115	Killik	Rural		Roman	Medium	Sinclair 1990, 67.
162	Laodicea (Lattaqia)	Urban	Urban supply	Herodian	High	Ball 2000, 52, 159; Josephus *BJ* 1.21.11.
98	Legio	Rural		2nd century AD	High	Tsuk 2002b.
107	Machaerus	Rural	Settlement	Nabataean	Medium	Glueck 1937-1939, 134.
73	Masada - lower	Aqueduct		Herodian	High	Patrich and Amit 2002, 17:Netzer 2002.
72	Masada - upper	Aqueduct	Cistern	Herodian	High	Patrich and Amit 2002, 17; Netzer 2002.
135	Mdawwara	Rural	Reservoir	Nabataean	Medium	Stein in Kennedy 1982, 264.
548	Misyaf	?	?	Roman	High	Meghraoui *et al.* 2003; personal observation.
638	Muqibleh	Urban	Urban supply	Late Roman	Low	Thomson and De Vries 1972, 89-90.
639	Nablus/Balata	Urban	Urban supply	Late Roman	Low	Thomson and De Vries 1972, 89-90; Bull 1965.
81	Neapolis	Urban		Roman	High	Patrich and Amit 2002, 10.
36	Palmyra - western/tombs/temple	Urban	Urban supply	Diocletianic or 1st century	Low	Michalowski 1967, 13; Michalowski 1970, 26; Crouch 1975, 165; Meyza 1985.
741	Palmyra - Efca	Urban	Urban supply	Roman	Low	Kobori 1989, 8; Kobori 1990, 322.
148	Petra	Urban	Urban supply	Nabataean	Medium	Irby and Mangles 1845, 127; Hammond 1973, 44.
152	Petra	Pipeline				Hammond 1973, 44.
85	Phasaelis	Rural	Agriculture, settlement	Hasmonean	Medium	Porath 2002a, 33; Glueck 1951, 416.
143	Qanat Far'un	Rural				Naval Intelligence Division 1920, 596.
137	Qasr Wadi Siq	Rural	Cistern	Nabataean	High	Glueck 1959, 234.
77	Qumran	Aqueduct	Baths	Herodian	Medium	Patrich and Amit 2002, 17; Ilan and Amit 2002.
15	Ramat Hanadiv – En Zur	Rural	Baths	Herodian	High	Patrich and Amit 2002, 17;Hirschfeld 2002b, 388-398; Hirschfeld and Birger 1985, 97; Avni 1988-9; Hirschfeld 2000, 293-310; Avni 1988-1989, 53f.
145	Resafe	Urban	Reservoir	Pre-542 AD	High	Musil 1928, 161; 265; Brinker 1991.
367	Rujm Karaka	Rural	Fort	Late Roman	High	MacDonald 1980.
153	Sabagh	Rural	Cistern			Kirkbride and Harding 1947, 13.
58	Samaria	Pipeline		Hellenistic and Herodian	Medium	Patrich and Amit 2002, 17; Frumkin 2002, 269.
59	Samaria - Naqura	Urban	Urban supply	Roman	High	Patrich and Amit 2002, 17; Frumkin 2002, 269-70.
60	Samaria - Shechem/Sebaste	Urban	Urban supply, agriculture	3rd - 4th century AD	Medium	Patrich and Amit 2002, 17; Frumkin 2002, 270-276.

Site no	Site Name	Aqueduct Type	Purpose Or Destination	Date	Confidence	Reference
57	Samaria/Sebaste	Pipeline		Hellenistic	Medium	Patrich and Amit 2002, 17; Frumkin 2002, 267-269.
116	Samosata	Urban	Urban supply	2nd century AD	High	Sinclair 1990, 140-1, 148.
727	Sbeiteh/Shivtah	Urban	Reservoir, church	Late Roman	High	Tsuk 2002c, 77-79.
62	Sepphoris - e-Reina	Urban	Reservoir, baths	Early 2nd century AD	Medium	Patrich and Amit 2002, 17; Tsuk 2002a, 281-284.
61	Sepphoris - Mash-had	Urban	Reservoir	Early 1st century AD	Medium	Patrich and Amit 2002, 17; Tsuk 2002a, 281-284; Patrich and Amit 2002, 17.
14	Sheikh Mohammed - Giv'at Yardinon	Rural		Late Roman	High	Urman 1985, App. A no. 40.
134	Shohba	Urban	Baths			Burckhardt 1822, 73.
97	Shuni	Rural	Theatre, pool	4th century AD	High	Hirschfeld 2002b, 398-400.
546	Si	Urban	Urban supply	1st century AD	High	Braemer 1984, 234.
140	Sidon	Urban	Urban supply	Roman	High	Naval Intelligence Division 1920, 404; Irby and Mangles 1845, 62.
52	Susita/Hippos - High	Urban	Urban supply	1st century AD	Medium	Ben David 2002; Tsuk *et al.* 2002; Patrich and Amit 2002, 17; Meshel *et al.* 1998.
53	Susita/Hippos - Kfar Charuv	Urban	Urban supply	Late Hellenistic	Medium	Tsuk *et al.* 2002, 207; Patrich and Amit 2002, 17; Meshel *et al.* 1998.
51	Susita/Hippos - Low	Urban	Baths, nymphaeum	1st century AD	Medium	Ben David 2002; Peleg 1991a, 132; Patrich and Amit 2002, 17; Meshel *et al.* 1998; Peleg 2001-2.
87	Suweida	Urban	Nymphaeum	Trajanic	High	Le Bas and Waddington 2303.
139	Sweimeh	Rural	Irrigation?; settlement?			Abel 1932, 84.
63	Tiberias - inc Beth Yerah	Urban	Baths, mill, agriculture, reservoir	late Roman	High	Patrich and Amit 2002, 17; Winogradov 2002; Conder and Kitchener 1881, 419.
146	Tripoli	Urban	Urban supply			Irby and Mangles 1845, 64.
673	Umm Qes – upper	Urban	Urban supply	Pre-4th century AD	High	Kerner 1993, 369-371; Kerner 1997, 285-287.
673	Umm Qes – lower	Urban	Urban supply	Roman	Low	Kerner 1993, 369-371; Kerner 1997, 285-287.
545	Umm Ratam	Rural	Fortress	Nabataean or Roman	Medium	Lindner *et al.* 2000, 554.
92	Urtas	Rural	Baths, mill			Amit 2002b, 261-2.
105	Wadi at-Taleh	Rural	Reservoir	Nabataean	High	Glueck 1935, 13; Glueck 1970, 61.
136	Wadi Birein	Rural	Irrigation; settlement			Mayerson 1960a, 38; Palmer 1871, 363-4.
42	Wadi Faynan	Rural	Reservoir, irrigation, mill, industrial			Barker *et al.* 1999.
142	Wadi Kafrinji	Rural	Mill			Naval Intelligence Division 1920, 586.
543	Wadi Ziqlab	Rural		Late Roman	Medium	Banning and Fawcett 1983, 302
151	Zeugma	Urban	Urban supply			Sinclair 1990, 156; Kennedy 1998, 39 and fig. 3.13.

7.2: Aqueducts ordered chronologically

Date	Aqueduct
Hellenistic	Acco
	Samaria/Sebaste
	Susita/Hippos – Kfar Charuv
2nd century BC	Antioch- mountain
1st century BC	Antioch - acropolis
Nabataean	Ain Shellaleh
	Auara
	Khirbet Ayun Ghuzlan
	Machaerus
	Mdawwara
	Petra
	Qasr Wadi Siq
	Wadi at-Taleh
Hasmonean	Cypros – short/upper
	Dok/Dagon
	Hyrcania – short/lower/northern
	Jericho palaces – N
	Jerusalem – Low
	Khirbet Urmeh-Aqraba
	Phasaelis
Herodian	Ashqelon
	Caesarea – High Level channel A
	Cypros – long/lower
	En Boqeq – south
	Herodion
	Hyrcania – long/upper/southern
	Jericho palaces – N extension
	Jerusalem – Biyar
	Jerusalem – High Level
	Laodicea (Lattaqia)
	Masada – lower
	Masada – upper
	Qumran
	Ramat Hanadiv – En Zur
Hasmonean or Herodian	Alexandrion/Sartaba – lower/Ras Kunetra
	Alexandrion/Sartaba – middle
	Alexandrion/Sartaba – upper
	Jericho palaces - SW
1st century AD	Antioch – north & central
	Banias
	Jerusalem – ‘Arrub
	Sepphoris – Mash-had
	Si
	Susita/Hippos – High
	Susita/Hippos - Low
2nd century AD	Antioch - south
	Apamea
	Caesarea – High Level channel B
	Cypros – local
	Dor - eastern
	Emmaus – main/upper
	Jerash
	Kanata (Kerak)
	Legio

Date	Aqueduct
2nd century AD (cont.)	Samosata
	Sepphoris – e-Reina
	Suweida
3rd century AD	Beth Govrin – east
	Beth Govrin – north
	Homs
	Samaria – Shechem/Sebaste
Roman	Birket Ali ad Dhaher
	Bosra
	Caesarea – High Level channel C
	Damascus
	Khan al-Manqoura
	Killik
	Misyaf
	Neapolis
	Samaria - Naqura
	Sidon
	Umm Qes – upper
4th century AD	Shuni
5th century AD	Chariton
	Emmaus - lower
6th century AD	Edessa
	Resafe
Late Roman	Bosana (Bousan)
	Caesarea – Low Level
	Caesarea – southern line
	Cypros
	Dor – southern
	Hammat Gader
	Khirbet al Gharbeh
	Khirbet Mird
	Rujm Karaka
	Sbeiteh/Shivtah
	Sheikh Mohammed – Giv'at Yardinon
	Tiberias
	Wadi Ziqlab

Gazetteer 8: *Nymphaea* and fountains

8.1 *Nymphaea*

Site No	Site name	Country	Date	Dating reliability	Comments	Reference
331	Antioch	Turkey	3rd century	Probable		Will 1997, 103; Lassus 1983, 217; Leblanc and Poccardi 1999, 100; Lassus *et al.* 1972, 44-47.
332	Antioch (Daphne)	Turkey				Leblanc and Poccardi 1999, 120 fig. 13.
335	Apamea	Syria			Terracotta pipe. Basin. Balustrade	Balty 1983, 259; Balty 1987, 20.
360	Apamea	Syria	2nd century	Probable	Northern Aqueduct fed	Balty 1987.
346	Banias	Israel	1st century AD	Probable		Tsaferis and Avner 1989/90, 3; Tsaferis and Israeli 1995, 5.
471	Beirut	Lebanon			Fronted by four columns	Saghieh-Beydoun *et al.* 1998-9, 114.
296	Bosra	Syria	late 2nd century	Questionable		Segal 1997, 157; Mougdad and Makowski 1983, 41.
303	Caesarea	Israel	1st century AD	Probable	Terracotta pipe Basin. Spouts	Porath 2002b, 122; Porath *et al.* 1998, 45; Porath 1996, 112-3.
295	Gadara	Israel	mid 2nd century	Probable	Barrel-vaulted cistern	Segal 1997, 154-5; Weber 1988, 349
298	Jerash	Jordan	late 2nd century	Probable	Pool Drainage provision	Segal 1997, 160-2; Harding 1967, 95; Horsfield 1926, 2; Fisher 1938, 21, 54.
292	Kanawat Kanata	Syria				Segal 1997, 152-3.
549	Pella	Jordan			Coin evidence	Smith 1969, 6; Dvorjetski 2001-2, 503.
300	Petra	Jordan			North. Pool	Segal 1997, 164; Bachmann *et al.* 1921, 34.
323	Petra	Jordan			South. 2 symmetric basins	Bachmann *et al.* 1921, 36.
297	Scythopolis	Israel	2nd century	Questionable	Ornamental pool – later addition	Segal 1997, 157-160; Foerster and Tsafrir 1988-1989, 18-21, figs 16-18; Tsafrir and Foerster, 1989/90, 122.
355	Scythopolis	Israel	Late Roman	Probable	Marble fountain heads Drainage provision	Bar Nathan and Mazor 1992, 36.
459	Sidon	Lebanon	2nd century	Probable	In area of Temple of Echmoun	Dunand 1967, 41.
294	Suweida	Syria	early 2nd century	Definite		Segal 1997, 154; Brunnow and Domeszewski 1904, 90.

8.2 Doubtful *nymphaea*

Site No	Site name	Country	Date	Dating reliability	Comments	Reference
299	Amman	Jordan	2nd half of 2nd century	Questionable	Barrel-vault over stream Possibly not a *nymphaeum*	Segal 1997, 162-4; Harding 1967, 68; Northedge 1992, 58; Almagro 1983, 631 figs 25-27; Waheeb and Zu'bi 1995.
491	Na'arran	Israel	3rd century	Probable	Not a *nymphaeum* according to later interpretation	Dauphin and Schonfield 1983, 197-204; Dauphin and Gibson 1991, 177.
293	Susita Hippos	Israel			Underground cistern Probably not a *nymphaeum*	Segal 1997, 153-4; Ben David 2002, 205-6; Segal 2000, 13*.
314	Zeugma	Turkey			2 doubtful *nymphaea*	Early *et al.* 2003, 15; 49-50.

8.3 Fountains

Site No	Site name	Country	Date	Dating reliability	Comments	Reference
573	Antioch	Turkey	Justinianic	Probable	Main Street Dig 16-0 south. To west. Possibly fed by stone pipeline	Lassus *et al.* 1972, 92.
358	Apamea	Syria	Roman	Probable	Stone block with pairs of holes along sides of streets	Personal observation, September 2004.
315	Jerash	Jordan			More than one fountain Along street of columns	Harding 1967, 94; Kraeling 1938, 291, pl. LVII.b.
315	Jerash	Jordan			Tetrapylon; lion-headed; fed by pipeline from northern decumanus	Ball 1986, 391.
315	Jerash	Jordan	2nd century	Probable	In octagonal *macellum* Pseudo-cross-shaped basin	Uscatescu and Martin-Bueno 1997, 67-72 figs 1 and 2.
315	Jerash	Jordan	3rd century	Probable	North-eastern corner of octagonal *macellum*	Uscatescu and Martin-Bueno 1997, 73.
315	Jerash	Jordan	3rd-5th centuries	Probable	South-eastern corner of octagonal *macellum*	Uscatescu and Martin-Bueno 1997, 73.
350	Jerusalem	Israel	Pre-Titus		Fountain of Siloam	Adan 1979.
333	Palmyra	Syria	Roman	Probable	Two triangular fountains in the agora fed by pipes	Crouch 1975, 16 fig. 14.
333	Palmyra	Syria	Roman	Probable	Exedra fountain	Crouch 1975, 16.
559	Petra	Jordan	*TPQ* 20-80 AD	Probable	Fountain fed by cistern on upper terrace	Schmid 2000, 339-343.
680	Scythopolis	Israel	Roman	Probable	Stone block with pair of holes near castellum	Fahlbusch 2002, 62.

Gazetteer 9: Aqueduct–fed public reservoirs and cisterns

9.1: Urban aqueduct-fed reservoirs

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
361	Apamea	Syria	6th century	High	22.9	5.86	1.5	201	3 basins	Agora	Balty 1987, 22.
361	Apamea	Syria	6th century	High	12	6	2	144		Grand Colonnade	Balty 1987, 22.
678	Bosra	Syria	Roman	Medium							Personal observation
304	Caesarea	Israel	Late Roman	High	4.5	2.5	3.2	36	Built	Palace garden	Porath 2002b, 124.
304	Caesarea	Israel			6.8	2.25	1.75	26	Hewn Fed by pipeline	Near bath	Porath 2002b, 124.
312	Capitolias	Israel			49	40	8	15,500	Open pool End of reservoir tunnel		Tsuk 2002a, 293; Harding 1967, 56; Schumacher and Le Strange 1890, 162-166.
312	Capitolias	Israel			77 ft	21ft	15 ft	690	With ?settling basin		Schumacher and Le Strange 1890, 162-166.
340	Dor	Israel	late Roman	High					One has sarcophagus settling tank		Stern 1985, 21.
324	Jerash	Jordan							Aqueduct fed		Irby and Mangles 1845.
310	Jerusalem	Israel							Large; Temple Mount area		Mazar 2002a, 223.
310	Jerusalem	Israel	Herodian/ Roman	Medium	16	15		960	Open Fed by 3 channels Re-worked in Late Roman period		Arubas and Goldfus 1993, 74-75.
310	Jerusalem	Israel						700		Monastery in 3rd wall area	Amit *et al.* 1993, 82-83.
325	Sbeiteh	Israel	TPQ 6th century	High				1215	Two irregular trapezoidal reservoirs Ostraca	Centre of southern part of city	Youtie 1936, 452-459. Tsuk 2002c, 74-5.
325	Sbeiteh	Israel	TPQ 6th century	High				810	Second irregular trapezoidal reservoir	Centre of southern part of city	Tsuk 2002c, 74-5.
311	Sepphoris	Israel			22	16	2	704	Masonry		Waterman 1937, 15.
313	Tiberias	Israel	late Roman	Med	32	9.6	6	2,000			Winogradov 2002, 302f.

9.2: Urban aqueduct-fed cisterns

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
361	Apamea	Syria	6th century	High					'in style of arches'		Shahada 1957, 164.
304	Caesarea	Israel	Late Roman	High					Barrel-vaulted cistern	Martyrium	Raban and Holum 1991, 112.
736	Dara	SE Turkey	Late Roman	High	13	c. 10	c. 3	390	Vaulted cistern		Preusser 1911, 46; Furlan 1995.
310	Jerusalem	Israel	Late Roman	High					#1 Barrel-vaulted	Monastery in 3rd wall area	Tsaferis *et al*. 1991, 132.
310	Jerusalem	Israel	Late Roman	High					#2 Barrel-vaulted	Monastery in 3rd wall area	Tsaferis *et al*. 1991, 132.
310	Jerusalem	Israel						44	Cistern 2	Monastery in 3rd wall area	Amit *et al.* 1993, 82-83.
310	Jerusalem	Israel	Late Roman						Cistern with settling tank	Monastery: Mt of Olives	Abu Raya 1994, 91-2.
679	Kanata (Qanawat)	Syria	Roman	Medium					Basalt roughly dressed; Makes one big chamber; 16 m^2 Steps down in corner where inlet/outlet point is. Covered.		Personal observation
363	Resafe	Syria	mid 6th	High				770	NW area 2 openings in roof		Brinker 1991.
325	Sbeiteh	Israel	Late Roman	High				162.5	North church	Church	Shereshevski 1991, 78-9. Tsuk 2002c, 67-74.
354	Scythopolis	Israel	Late Roman	High	6.5	2.9		37	Barrel-vaulted	Near theatre	Mazor and Bar-Nathan 1998, 8.
311	Sepphoris	Israel	Roman	High				187	Plaster-lined; vaulted with 2 arches; aqueduct fed		Tsuk 2004, paper presented at Cura Aquarum in Ephesus conference.
311	Sepphoris	Israel	Roman	High				117	Rectangular; covered by 5 arches; plaster-lined		Tsuk 2004, paper presented at Cura Aquarum in Ephesus conference.
320	Sepphoris	Israel							Cisterns Rock-cut Some stepped		Waterman 1937, 15, 32.

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
318	Umm al Jimal	Jordan							Large; public		Harding 1967, 149-152.
318	Umm al Jimal	Jordan							Stores water brought from wadi		Harding 1967, 149-152.

9.3: Urban aqueduct-fed reservoir cisterns

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
353	Beth Govrin (Be'er Reseq)	Israel	1st or 2nd century	High	60	14.5		4,000	Masonry Renovated in Late Roman period Aqueduct fed Paving with shaft Room of unknown function		Khalaily and Sagiv 1995, 93-94.
312	Capitolias	Israel			275	2.5	7.2	4,900	'Reservoir' tunnel Subdivided Under city wall		Tsuk 2002a, 293; Harding 1967, 56; Schumacher and Le Strange 1890, 162-166.
728	Dara	SE Turkey	6th century	High	25	40	5 (?)	5,000	10 parallel barrel-vaulted halls, each 4 m wide and c. 25 m long. May be the cistern mentioned by Procopius *De Aed*. II, 2.1.	Possibly associated with church	Preusser 1911, 45; Mango 1974, 39; Furlan 1995; E. Keser-Kayaalp pers. comm.
310	Jerusalem	Israel	6th century	High	17	9.5	33	5,329	6 vaulted halls Niches Terracotta pipelines	Nea Church	Avigad 1983, 233-245.
363	Resafe	Syria	mid 6th century	High				14,600	'Big' 8 chambers with settling tanks		Musil 1928, 161, 265; Brinker 1991.
363	Resafe	Syria	early 7th century	High				2,050	'Small' 4 chambers		Brinker 1991.
363	Resafe	Syria	early 7th century	High				3,400	'Domed cistern' 3 chambers		Brinker 1991.
311	Sepphoris	Israel	Roman	High				4,300	'Reservoir' tunnel 9 openings		Tsuk 2002a, 287-293.

9.4: Non-urban aqueduct-fed reservoirs

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
365	Auara	Jordan	Roman or Late Roman	High	30	14	2	840	#1	Fort	Eadie and Oleson 1986, 56-61.
365	Auara	Jordan	Nabataen	High	27.6	17		704	# 2 Aqueduct fed		Eadie and Oleson 1986, 56-61.
362	Khan al-Manqoura	Syria			42 + 42	42 + 29		7050 + 3500	With settling tank and steps	Military site	Musil 1928, 32.
367	Rujm Karaka	Jordan	late Roman	High					Aqueduct fed	Fort	MacDonald 1980.

9.5: Non-urban aqueduct-fed cisterns

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
337	Qasr Wadi as-Siq	Israel	2^{nd} –4^{th} century	High	7	7	3.5	171.5	3 openings in ceiling Fed by channel		*ESI* 1, 1982 86-7.

Gazetteer 10: Public cisterns and reservoirs supplied from other sources

10.1: Non-aqueduct fed urban reservoirs

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Public building	Reference
356	Acco	Israel	Late Roman	High				38	Terracotta pipes		Tatcher 1998, 12.
560	Ar-Rabbah	Jordan	Roman	High					#1 Trapezoidal		Gysens 2002, 496-7.
560	Ar-Rabbah	Jordan	Roman	High					#2		Gysens 2002, 496-7.
560	Ar-Rabbah	Jordan	Roman	High					#3		Gysens 2002, 496-7.
340	Dor	Israel	Roman	Medium	6	3.5			Two plastered depressions with water jars	Piazza	Berg *et al.* 2002, 162.
568	Eboda	Israel	Late Roman	High					#1 2 km from settlement		Shereshevski 1991, 47.
568	Eboda	Israel	Late Roman	High					#2 2 km from settlement		Shereshevski 1991, 47.
570	Elusa	Israel	Late Roman	High	10	5	2	100	Fed by well water?		Shereshevski 1991, 89.
357	Horvat Castra	Israel						900			Yeivin and Finkielsztejn 1999, 23*.
326	Irbid	Jordan	'ancient'								Schumacher and Le Strange 1890, 149.
310	Jerusalem	Israel	Roman	High					Literary reference to double 'pool' with five porticoes		Hamilton 1952, 84; St John V.I; Eusebius *Onomasticon.*
366	Nessana	Israel	Late Roman	High					Reservoir in western boundary of town		Shereshevski 1991, 59.
572	Saadi	Israel	Late Roman	High					#1		Shereshevski 1991, 93.
572	Saadi	Israel	Late Roman	High					#2		Shereshevski 1991, 93.
354	Scythopolis	Israel	Pre-6th century AD	High		8	0.7		3 marble-faced steps. In use until 6th century		Tsafrir and Foerster 1989-1990, 126.

10.2: Non-aqueduct fed urban cisterns

Site No	Site name	Country	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Element Type	Public building	Reference
340	Dor	Israel	Late Roman	High						Under church	*ESI* 2, 24.
330	Dura Europos	Syria								Temple of Atargatis	Matheson 1992, 130.
568	Eboda	Israel							Several mentioned		Shereshevski 1991, 47.
351	Horvat Zikhrin	Israel	Late Roman	High				237	Cisterns		Fischer 1993, 45.
324	Jerash	Jordan							#1	N of the forum	Horsfield 1926, 2.
324	Jerash	Jordan							#2	N of the forum	Horsfield 1926, 2.
324	Jerash	Jordan							#3	S decumanus	Gawlikowski 1986, 110.
324	Jerash	Jordan	Early 2nd century	High					#4	Temple stairway	Bitti 1986, 189.
324	Jerash	Jordan	1st century AD	High					#5	Cardo/decumanus corner	Watson 1986, 359.
324	Jerash	Jordan							#6 Barrel-vaulted	St Theodore's	Kraeling 1938, 282; Kalayan 1981, 332.
310	Jerusalem	Israel						67	#1	Monastery in 3rd wall area	Amit *et al.* 1993, 82-83.
567	Kurnub	Israel	Late Roman	High	18	10	3	540	Roofed with decantation basin		Shereshevski 1991, 33-34.
554	Lejjun	Jordan	Late Roman	High					Circular and ringed with steps leading down		Parker 1990, 368 fig. 13
366	Nessana	Israel	Late Roman	High	2.6		10.5	55	Cistern 1 Bottle shaped	North church	Colt 1950, vol 1; Shereshevski 1991, 54, 59.
366	Nessana	Israel	Late Roman	High	4.7		4	69	Cistern 2 Cylindrical	North Church	Colt 1950, vol 1; Shereshevski 1991, 59.
366	Nessana	Israel							Cistern 3/tank	South church	Colt 1950, vol 1.
366	Nessana	Israel							Cistern 4	Acropolis	Shereshevski 1991, 59.
366	Nessana	Israel							Cistern 5	Acropolis	Shereshevski 1991, 59.
366	Nessana	Israel							Cistern 6	Acropolis	Shereshevski 1991, 59.
366	Nessana	Israel							Cistern 7	Acropolis	Shereshevski 1991, 59.
366	Nessana	Israel			10.83	3.75	3.6	146	7 arches	Fort	Colt 1950, vol 1.
316	Petra	Jordan							#1	High Place	Harding 1967, 136.
316	Petra	Jordan							#2	High Place of Sacrifice	Harding 1967, 136.
319	Qasr al-Hallabat	Jordan							Cisterns	Fort	Harding 1967, 154; Glueck 1970, 42.

Site No	Site name	Country	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Element Type	Public building	Reference
363	Resafe	Syria						20 – 30	Bottle cistern 1	Basilica A	Brinker 1991.
363	Resafe	Syria						20 – 30	Bottle cistern 2	Basilica A	Brinker 1991.
325	Sbeiteh	Israel	Late Roman	High					5 cisterns beneath atria of 2 churches (not including N church).	Churches	Shereshevski 1991, 78-9. Tsuk 2002c, 67-74.
320	Sepphoris	Israel								Unspecified	Myers *et al*. 1986, 103.
320	Sepphoris	Israel							Interconnected with others		Weiss and Netzer 1998, 23, 26.
320	Sepphoris	Israel	Late Roman	High						Nile Festival Hall	Weiss and Netzer 1998, 23, 26.
474	Sumaqa	Israel			9.8	6.5	4	250	Cistern 70-80 m away from settlement		Dar 1999, 72.
474	Sumaqa	Israel	Pre 4th century	High	6.5	4	2.5	75	Underground with steps leading down		Dar 1999, 70-72.
313	Tiberias	Israel	Late Roman	High	7.5	7.5	5	280	Cistern with settling tank	Church	Hirschfeld 1994, 33.
313	Tiberias	Israel	mid 4th century	High	7.2	7.2	3.2	160		Basilica square	Hirschfeld 1996, 38.

10.3: Non-urban reservoirs not supplied by an aqueduct

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Building	Reference
348	Deir Qalah	Israel	Late Roman	High	33.4	10.2	8	5000	#1 2 neighbouring pools receive overflow	Monastery	Hirschfeld 1989/90a, 49-51.
348	Deir Qalah	Israel	Late Roman	High	9.7	8.6	4.7	392	#2	Monastery	Hirschfeld 1989/90a, 49-51.
348	Deir Qalah	Israel	Late Roman	High	8.8	7.2	3	190	#3: 7 steps	Monastery	*Ibid*.
336	East Talpiot	Israel	Late Roman	Medium					#1 Circular		*ESI* 1, 1982, 52.
336	East Talpiot	Israel	Late Roman	Medium					#2		*ESI* 1, 1982, 52.
336	East Talpiot	Israel	Late Roman	Medium					#3 Central reservoir with conical stone flanked by 2 hollows		*ESI* 1, 1982, 52.
336	East Talpiot	Israel	Late Roman	Medium					Square pool with metal spike		*ESI* 1, 1982, 52.
562	Kafr Neffakh	Israel							Reservoir Part hewn with steps		Dauphin and Gibson 1991, 177.
344	Monastery of St Theodosius	Israel	5th century	High	29	14	10	4000	Reservoir	Monastery	Hirschfeld 1988/9a, 102.
319	Qasr al Hallabat	Jordan								Fort	Harding 1967, 154; Glueck 1970, 42.
558	Tell al Kharrar	Jordan	5th to 6th century	High					South Stepped	Churches	Waheeb 1999, 553-5.
558	Tell al Kharrar	Jordan	5th to 6th century	High					North-western reservoir	Churches	Waheeb 1999, 553-5.
551	Tell Hesban	Jordan	Late Roman	High					Next to wadi		Geraty 1975, 54.
555	Wadi Bayir	Jordan	Nabataean or Roman	Low					complex sluice system and connected to wadi	Fort	Gysens and Al-Khraysheh 1995, 359.
730	Sabkhah	Jordan									Glueck 1944,9.
731	Sabkhiyeh	Jordan									Glueck 1944,9.
729	Ba'eij	Jordan									Glueck 1944,9.
735	Burqa'ah	Jordan									Glueck 1944, 9.
732	Dafyaneh	Jordan									Glueck 1944,9.
733	Deir al Kahf	Syria	4th century	High	6	7.7			Platform: 2.85 m wide on fortress side. May have supported *shaduf*.	Fort	Glueck 1944,9; Butler *et al.* 1907, II A, 148.
734	Umm al-Qetein	Jordan									Glueck 1944,9.

10.4: Non-urban cisterns not supplied by an aqueduct

Site no	Site name	Location	Date	Confidence	Length (m)	Width (m)	Depth (m)	Capacity (m^3)	Comment	Building	Reference
345	Al Qasr	Israel	Late Roman	High					Cistern	Church	Hirschfeld 1988/89b, 149-150.
564	Farj	Israel	Late Roman	High				94	Cistern	Church	Dauphin and Gibson 1991, 178.
338	Judaean desert survey	Israel	Late Roman	High	8.7	7.3	7	240	Oval cistern Supported by arches	Monastery	*ESI* 2, 1983, 59.
347	Judean Desert survey	Israel			3.9	3.9	3.5	41	Cistern	?Monastery	Hirschfeld 1989/90a, 46.
349	Khirbet Deir ar-Ruhban	Israel	Late Roman	Low					Cistern Oval Prominent bosses on ashlar	Monastery	Hirshfeld 1989/90b, 59.
341	Monastery of St Euthymius	Israel	Late Roman	High	7	5.5	4	150	Cistern Bell-shaped	Church	Hirschfeld 1984, 81-2.
341	Monastery of St Euthymius	Israel	Late Roman	High	34	15	4	268 + 202	Cistern with settling basin 2 narrow vaulted chambers		Hirschfeld 1984, 81-82.
329	Tell Debbeh	Syria	Roman	Medium					Cistern Ovoid		Braemer 1984, 246.
557	Wadi al Kharrar	Jordan	Late Roman	High					Cistern Pear shaped	Monastery	Waheeb 1999, 552, fig. 6.
557	Wadi al Kharrar	Jordan	Late Roman	High					Cistern with vaulted roof and two settling tanks Fed by wadi	Monastery	Waheeb 1999, 551-2.
342	Wadi al-Ein	Israel	Late Roman	High					Cistern 1		Hanin 1985, 109-10.
342	Wadi al-Ein	Israel	Late Roman	High					Cistern 2		Hanin 1985, 109-10.
342	Wadi al-Ein	Israel	Late Roman	High					Cistern 3		Hanin 1985, 109-10.
342	Wadi al-Ein	Israel	Late Roman	High					Cistern 4 Vaulted		Hanin 1985, 109-10

Gazetteer 11: Single parts of drainage systems

Site No	Site Name	Element Type	Building material	Phase	Comments	Reference	Proposed Order
532	Antioch	drain		Roman	Main Street Dig III 19.M Runs under channel along side of road Cover stones not present 0.5 m wide x 0.42 m deep	Lassus and Stillwell 1972, 32.	3/4 Size suggests 4
532	Antioch	drain	Re-used building materials	Roman	Main Street Dig VII 16-O South Under polygonal pavement 0.4 m wide x 0.8 m deep	Lassus and Stillwell 1972, 96.	4
531	Aqaba	drainage		late Roman	Area M System of drainage channels Part of drain lined with re-used ceramic vessels	Parker 2000, 379-80, fig. 6.	3
470	Beirut: Bey 004	drain	rock cut with large capstones	1st century AD	Central drain	Saghieh-Beydoun *et al.* 1998-9, 106.	4
468	Beirut: Bey 010	drain		Late Roman	Found in small road to S oriented E-W	Sayegh 1996, 263.	3
485	Caesarea	sewer 2		Late Roman	Smaller than Roman sewer Possible bathhouse to S	Bull and Toombs 1972, 180.	3/4
485	Caesarea	sewer 3		Late Roman	Smaller than Roman sewer Possible bathhouse to S	Bull and Toombs 1972, 180.	3/4
485	Caesarea	drains			Sounding B: lane with drainage channels below	*ESI* 1, 1982, 14.	3
485	Caesarea	drain 1	ashlar Covered by stone slabs	Roman	Area J3 One of 3 drainage channel one on top of each other Drain N towards sea	Raban 1988-9, 39-40.	4
485	Caesarea	drain 2	ashlar Covered by stone slabs	Roman	Area J3 2 of 3 drainage channel one on top of each other Drain N towards sea	Raban 1988-9, 39-40.	4
485	Caesarea	drain 3	ashlar Covered by stone slabs	Roman	Area J3 3 of 3 drainage channel one on top of each other Drain N towards sea	Raban 1988-9, 39-40.	4
485	Caesarea	drain	masonry Plastered	late Roman	Stratum IV S gate in Crusader wall area	Porath *et al.* 1989-90, 133.	3
478	Dor	drain		125 BC - AD 135	Underneath street II W4533	Stern and Berg 1995, 44, plan 4.6.	3
478	Dor	drain		AD 138-230	In street II W4509	Stern and Berg 1995, 46, plan 4.6.	3
478	Dor	drain	ashlar	earlier Roman	Area F-2 Pre-temple covered drain channel Cut late Hellenistic walls	Stern and Sharon 1993, 133; Stern *et al.* 1997, 29.	3
476	Jerash	drain	stone		North decumanus: N sidewalk U-shaped Near pipeline feeding tetrapylon fountains	Ball 1986, 391.	3
476	Jerash	drain	Covered with stone slabs		North decumanus: S pavement U-shaped at lower level	Ball 1986, 391, pl. XIII.1-2.	3
476	Jerash	drain			In forum/plaza. Comes from cardo and goes to SW corner of plaza.	Harding 1949, 15.	4
522	Jerusalem	drain	rock cut Roofed by elongated stone vault	1st century BC	Robinson's Arch Part of drainage system in street on two levels. Lower system: larger than upper	Reich and Billig 1998, 90.	5 Based on size: 1 m wide x 4 m deep

Site No	Site Name	Element Type	Building material	Phase	Comments	Reference	Proposed Order
522	Jerusalem	drain		Late Roman	Cardo Maximus Drainage channels in street	Chen 1982, 43	4
527	Lejjun	drain	stone		Street to N of via praetoria In principia	Parker 1990, 361.	3
529	Pella: Tall al-Husn	drain		Late Roman	Plot 34B Box drain F25 running into wall 6	Watson and Tidmarsh 1996, 308, fig. 16.	2/3
525	Petra	drain		pre 8th century	Built into theatre after it had gone out of use	Hammond 1964, 82.	3
526	Rujm al-Malfuf	drains	plastered		Square 1 Levels show intended to take ground water away from foundations to SW in locus 7 Drainage probably down to wadi	Boraas 1971, 36-7, fig. 6.	3
519	Scythopolis	drain		Roman	NE side of Late Roman 'commercial' street	Foerster and Tsafrir 1992, 28.	3/4
494	Sepphoris	drain 1	Well-built, finely plastered and capped with carefully cut stones	early to Late Roman	Area 6 (96.2) Large drain running SE-NW 3 stages of use and re-use	Strange and Longstaff 1987, 280.	4
494	Sepphoris	drain 2	Well-built, finely plastered and capped with carefully cut stones	early to Late Roman	Area 6 (96.2) Large drain running SE-NW 3 stages of use and re-use	Strange and Longstaff 1987, 280.	4
494	Sepphoris	drain 3	Well-built, finely plastered and capped with carefully cut stones	early to Late Roman	Area 6 (96.2) Large drain running SE-NW 3 stages of use and re-use	Strange and Longstaff 1987, 280.	4
494	Sepphoris	drain			Field 2.5: N and W of theatre Helps regulate flow of water from theatre	Strange, Groh and Longstaff 1988, 190.	4
494	Sepphoris	drain		Roman	Area 84.1 Under E-W paved street	Meyers, Netzer and Meyers 1990, 219; Meyers, Netzer and Meyers 1988-9, 169	3
494	Sepphoris	drain			Area 66.1 Drainage channel to one side of stone-paved narrow street	Netzer and Weiss 1993, 14.	3
494	Sepphoris	drain			Drainage channel in street S of Nile Festival Bldg.	Weiss and Netzer 1998, 26.	3
521	Tiberias	drains	Basalt cover slabs	mid 4th century	Area F: Basilica Well-built drainage channels 0.3 m wide x 0.6 m deep	Hirschfeld 1996, 38, fig. 39.	3/4 Size suggests 4
528	Umm Qes	drainage			Sloping street inclined to N. Waste water runs W along N sidewalk. Channel conducted water through N tower to avoid banked up water in front of threshold.	Kerner and Hoffmann 1993, 363.	-

Gazetteer 12: Drainage complexes

Site No	Site Name	Element Type	Length (m)	Breadth (w)	Depth (m)	Building Material	Phase	Comments	Reference	Proposed Order
532	Antioch	drain		0.35	0.65	Brick and stone	Justinianic	Main Street Dig III 19-M Drain in road on top of Hellenistic wall Fed by a poorly-constructed drain	Lassus and Stillwell 1972, 28.	4
532	Antioch	drain		0.26	0.25	stone	?post-Arab conquest	Main Street Dig III 19-M Poorly-constructed drain feeding Justinianic main drain	Lassus and Stillwell 1972, 28.	3
530	Auara	drain		0.15	0.15	Stone with earth floor		Barracks room G Continued under W wall of G and below street where accessed by sandstone cover Continued W under via praetoria where entered large N/S drain Rosette-shaped drain cover	Oleson *et al*. 1999, 420.	2/3
530	Auara	drain		0.30	0.25	sandstone		N/S drain in via praetoria Carries water out of S gate possibly to fields	Oleson *et al*. 1999, 420.	5
520	Banias	drain		0.35	0.40	Sides and bottom coated with grey plaster and covered with ashlars	3rd-5th century	Temple of Pan, Area C Drainage system running N-S under missing pavement of Roman street	Ma'oz 1993, 6.	4
520	Banias	drain 2						Temple of Pan, Area C One of three narrower drains branching E from main drain	Ma'oz 1993, 6.	3
520	Banias	drain 3						Temple of Pan, Area C 2 of 3 narrower drains branching E from main drain	Ma'oz 1993, 6.	3
520	Banias	drain 4						Temple of Pan, Area C 3 of 3 narrower drains branching E from main drain	Ma'oz 1993, 6.	3
463	Beirut: Bey 027	drain		0.60		Limestone with limestone cover slabs	5th century	V-shaped drain in road running E-W to centre of town Fed by secondary channels at right angles	Arnaud *et al*. 1996, 111, plan 6.	4
463	Beirut: Bey 027	drains					5th century	Secondary channels feeding main drain at right angles	Arnaud *et al*. 1996, 111, plan 6.	3

Site No	Site Name	Element Type	Length (m)	Breadth (w)	Depth (m)	Building Material	Phase	Comments	Reference	Proposed Order
485	Caesarea	sewer			3.00		Roman	Beach N of Strato's Tower Barrel-vaulted Fed by 2 drains from E	Bull and Toombs 1972, 180.	4/5 Depth suggests 5
485	Caesarea	drain 1						Feeds sewer from E	Bull and Toombs 1972, 180.	3/4
485	Caesarea	drain 2						Feeds sewer from E	Bull and Toombs 1972, 180.	3/4
485	Caesarea	drain						Cardo W1 Goes N to intersection with decumanus S2 and then turns W towards the sea Collects water from drains under streets and alleys	Porath *et al.* 1998, 42.	5
485	Caesarea	drains						Under streets and alleys Direct water to main drain under Cardo W1	Porath *et al.* 1998, 42.	3/4
485	Caesarea	drain					Late Roman	Area CC Comes out of latrine and feeds main drain under decumanus	Porath *et* al. 1998, 55.	2
485	Caesarea	drain						Area CC Main drain under decumanus Collects water from drain leaving latrine	Porath *et al.* 1998, 55.	5
485	Caesarea	drains					AD 525-640	L, SE quadrant, Area 1 'Converging drains'	Wiemken and Holum 1981, 34, fig. 8.	3/4
485	Caesarea	drain		0.65	1.05	ashlar	AD 525-640	E-W drain with manhole Under Decumanus II S in K, Area 3 Fed by subsidiary channels Slope and direction of flow unknown Fish bone and scales found in lower fill	Wiemken and Holum 1981, 34-8.	5
485	Caesarea	drain					AD 525-640	Southern subsidiary channel Feeds main drain under decumanus II S Drains street from gutter at south curb	Wiemken and Holum 1981, 34-8.	4
485	Caesarea	gutter						Feeds south subsidiary drain of decumanus II S In street	Wiemken and Holum 1981, 34-8.	3
485	Caesarea	drain						Northern subsidiary channel Feeds decumanus II S drain Source unknown	Wiemken and Holum 1981, 34-8.	4
478	Dor	drain					125 BC - 135 AD	L486: Street I Probably lower end of gutter from houses	Stern and Berg 1995, 44, plan 4.6.	3

Site No	Site Name	Element Type	Length (m)	Breadth (w)	Depth (m)	Building Material	Phase	Comments	Reference	Proposed Order
478	Dor	drain					125 BC - AD 135	L539: Street I Probably lower end of gutter from house	Stern and Berg 1995, 44-46, plan 4.6.	3
478	Dor	drain					125 BC - AD 135	L556: Street I Probably lower end of gutter from house	Stern and Berg 1995, 44-46, plan 4.6.	3
478	Dor	drain				Capped with stone	AD 138-230	L430, L429, L4310: Street I Main drain	Stern and Berg 1995, 44-46, plan 4.6.	4
478	Dor	drainage					1st century or early 2nd century	Area B2 Elaborate system associated with piazza Meanders down to lower city Large enough for man to walk through Manhole at junction of drains Vaulted	Stern and Sharon 1987, 209-11; Stern *et al.* 1991, 49; Berg *et al.* 2002, 164-7; Stern and Gilboa 1989-90, 117.	5
478	Dor	drain					1st/2nd century	N-S drain under street pavement in Area G Secondary channel joins drain Main drain large enough for man to walk through	Stern and Sharon 1987, 209-11; Stern *et al.* 1989, 41; Stern *et al.* 1988-9, 49; Berg *et al.* 2002, 164-7.	5
478	Dor	drain						Secondary channel joining N-S drain in Area G One of four marked on fig. 12 in Berg *et al*. 2002	Stern *et al*. 1989, 41; Stern *et al*. 1988-9, 49; Berg *et al.* 2002, 164-7, fig. 12.	4
478	Dor	drain						Secondary channel joining N-S drain in Area G 2 of 4	Berg *et al.* 2002, 164-7, fig. 12.	4
478	Dor	drain						Secondary channel joining N-S drain in Area G 3 of 4	Berg *et al.* 2002, 164-7, fig. 12.	4
478	Dor	drain						Secondary channel joining N-S drain in Area G 4 of four marked on fig. 12 in Berg *et al.* 2002	Berg *et al.* 2002, 164-7.	4
523	Horbat Castra	drainage						Drainage from structures Flows to hewn channel	Yeivin and Finkielsztejn 1999, 23*.	2
523	Horbat Castra	drain						Long channel roofed with slabs fed by drainage from structures E-W orientation Feeds cesspool near edge of city	Yeivin and Finkielsztejn 1999, 23*.	5

Site No	Site Name	Element Type	Length (m)	Breadth (w)	Depth (m)	Building Material	Phase	Comments	Reference	Proposed Order
476	Jerash	drain						Area by S decumanus 'Sewage drain' from N Leads to collector drain under decumanus	Gawlikowski 1986, 110.	4
476	Jerash	drain						Decumanus Collector under dec Fed by drain from N	Gawlikowski 1986, 110	5
522	Jerusalem	drain						Robinson's Arch Part of drainage system in street on two levels Upper level Pipes drain water into this channel Incorporated into pavement	Reich and Billig 1998, 90.	3
522	Jerusalem	pipes						Robinson's Arch Feed upper part of drainage system	Reich and Billig 1998, 90.	2
524	Palmyra	drain 1		0.23	0.23	Limestone Covered with capstones		Tetrapylon Subterranean Passes between columns C and F Has rosette style drain cover Fed by drain 2	Michalowski 1960, 97, fig. 7.	4
524	Palmyra	drain 2		0.17	0.05			Tetrapylon Type 2 'channel' Cut into paving One such channel directs water along NE façade into drain 1	Michalowski 1960, 97-8.	3
525	Petra	drainage						Depression in middle of excavated street Diverts runoff to drain system under street	Zayadine and Farajat 1991, 286-8.	3
525	Petra	drain						Under sidewalk Fed by run-off from street	Zayadine and Farajat 1991, 286-8.	4
519	Scythopolis	drain						Palladius Street: shops and portico Channel under mosaic floor drained water into main drain in middle of street	Bar-Nathan and Mazor 1992, 42.	2
519	Scythopolis	drain						Palladius Street Main drain in middle of street Fed by drains from shops and propylaeum Inspection chambers also found along drain	Bar-Nathan and Mazor 1992, 42; Mazor and Bar-Nathan 1998, 15.	4
519	Scythopolis	drain						Palladius Street: propylaeum Drainage channel running NW-SE joins drain in Palladius Street	Bar-Nathan and Mazor 1992, 45.	3

Site No	Site Name	Element Type	Length (m)	Breadth (w)	Depth (m)	Building Material	Phase	Comments	Reference	Proposed Order
494	Sepphoris	drain		0.58		Arched capstones	early Roman?	Field 2.8: north and west of theatre Connected to smaller drain	Strange *et al.* 1988, 190.	4
494	Sepphoris	drain						Field 2.8 Connected to larger drain in this area	Strange *et al.* 1988, 190.	3
494	Sepphoris	drain						Area 85.3: under Roman road Connected to drains directing water from higher elevations	Meyers *et al.* 1994, 249.	4
494	Sepphoris	drains						Area 85.3 Direct water from higher elevations into drain under Roman road	Meyers *et al*. 1994, 249.	3
477	Zeugma	drain	20.00		1.50	Flat capstones	pre-5th century	*Chantier* 6 Under road 2 secondary channels found	Abadie-Reynal 1997, 357, figs 11-12.	4
477	Zeugma	drain						One of 2 secondary channels in *chantier* 6	Abadie-Reynal 1997, 357.	3
477	Zeugma	drain						Second of 2 secondary channels in *chantier* 6	Abadie-Reynal 1997, 357.	3
477	Zeugma	drain	100.00	1.50	3.50		?pre 1st century AD	*Chantier* 9 Divided into lower and upper channels Several channels converge into this drain To S drain makes a change in direction to E Accessed by manhole 7 m below occupation levels Heads down towards Euphrates	Abadie-Reynal 1998, 392, figs 13-15; Abadie-Reynal 2001, 251.	5
477	Zeugma	drains				Brick and stone		Secondary channels feeding into main drain in *chantier* 9	Abadie-Reynal 1998, 392; Abadie-Reynal 2001, 251.	4

Gazetteer 13: Public latrines

Site no	Location	Date	Bath Yes/No	No of seats	Gutter (width x depth (m))	Drain (width x depth (m))	Comments	References
267	Antioch Bath E	4th century AD	Y [#262]	16 - 18	0.10	0.50	Geometric mosaic with swastikas	Levi 1947, 260 pl. CXb, fig. 100; Campbell 1936, 1.
724	Antioch – Bath F	Roman	Y [#723]				Small	Stillwell 1941, 8.
210	Apamea	mid 2nd century AD	N	80 - 90	0.10 x 0.02	0.50 x 2.00	Atrium design with 12 columns Mosaics	Neudecker 1994, 157; Balty 1981, 76 figs 76-7; Schmidt-Colinet 1984, 141-149.
702	Apamea		?		0.1 x 0.05	0.62 x 0.58 (minimum)	Sunken, plastered floor with basin.	Personal observation.
710	Apamea	Late Roman	N				Poor construction Inserted into agora entrace	Butcher 2003, 263; personal observation.
262	Athis/Dibsi Faraj – Public	4th century AD	Y [#262]					Harper and Wilkinson 1975, 329.
268	Athis/Dibsi Faraj - Principia	Late Roman	N					Harper and Wilkinson 1975, 328.
269	Athis/Dibsi Faraj – Principia	Late Roman	N					Harper and Wilkinson 1975, 328.
286	Caesarea	6th century AD	Y [#288]					Horton 1996, 183.
701	Caesarea	Late Roman	?			0.45 x 1.75	Anteroom	Porath, Raban and Patrich 1998, 54.
211	Dura Europos F3	pre 165 AD	Y [#244]			0.48 x 0.82		Neudecker 1994, 158; Brown 1936, 71.
247	Dura Europos C3	3rd century	Y [#247]				Possible wash room	Brown 1936a, 95.
703	Herod's 2nd Palace - Jericho	Herodian	Y [#716]				No water supply or drainage. PRIVATE.	Netzer 2001a, 211-2.
272	Jekmejeh (near Antioch)	2nd or 5th centuries AD	Y [#271]	15				Stillwell 1941, 25.
285	Jerash – Baths of Placcus	454 AD	Y [#287]	12 - 15	c. 0.10		Mosaic with simple scale pattern	Fisher 1938b, 266.
237	Palmyra	Diocletianic	Y [#216]		0.1	0.6		Bounni and Asad 1989, 71; personal observation.
700	Scythopolis - West Baths	6th century	Y [#694]				Anteroom; roofed and open air areas; opus sectile.	Mazor and Bar-Nathan 1998, 23.
693	Scythopolis – East Baths	Late Roman	Y [#685]	57		0.5 x 2.5	Mosaic; reused capitals in porticoes; reused marble for seats.	Mazor and Bar-Nathan 1998, 14.

Site no	Location	Date	Bath Yes/No	No of seats	Gutter (width x depth (m))	Drain (width x depth (m))	Comments	References
699	Scythopolis – West Baths	Pre- 6th century	Y [#694]					Mazor and Bar-Nathan 1998, 21.
283	Serjilla	473 AD	Y [#265]					Butler 1907, II.B.3, 118, 121.
270	Toprak en Narlidja (near Antioch)	mid 5th century AD	Y [#266]	10		0.50		Stillwell 1941, 19.
217	Zeugma	Roman	Y [#217]	7	0.10	0.50 x 1.00	Basin in SE corner Ceramic downpipe	Early *et al.* 2003, 55-6.
218	Zeugma	Roman	?					Early *et al.* 2003, 56.

Gazetteer 14: Bathhouses

14.1 Herodian and early Roman bathhouses (late 1st century BC and 1st century AD)

Site no	Name	Location (modern)	Comments	Reference
711	Caesarea – Promontory Palace	Israel		Levine and Netzer 1986, 149-160; Hoss 2005, 45.
258	Cypros - Lower Slope	Israel		Netzer 1975, 55-7; Nielsen 1993, Vol. 2, 41; Netzer 2004, 265-271.
712	Cypros – Summit Plateau	Israel	Two tubs; *labrum*	Netzer 2004, 251-8.
224	Hammam az-Zara	Israel		Dvorjetski 1999, 118, 121 fig. 1.
208	Hammam Suleiman	Israel	Aqueduct	Amit 2002b, 261.
714	Herodium – Lower Palace	Israel		Netzer 1980.
713	Herodium – Lower Palace W wing	Israel	*Labrum*	Netzer 2001b, 107-116.
213	Herodium - Palace	Israel		Netzer 1981 47-8; Nielsen 1993, vol.2, 41; Ward-Perkins 1981, 313.
715	Jericho – Herod's Second Palace	Israel	Tub	Netzer 2001a, 211-217.
716	Jericho – Herod's Second Palace	Israel	Latrine #703	Netzer 2001a, 220-221.
717	Jericho – Herod's Third Palace	Israel	*Opus reticulatum*	Netzer 2001a, 254-274.
250	Jericho - Herod's 1st palace	Israel	Cistern; reservoir	Pritchard 1958, 9-10.
718	Machaerus	Israel		Loffreda 1991, 105-114.
230	Masada – W palace	Israel	Cistern; basin	Netzer 1999, 48; Netzer 1991, 251-263.
235	Masada – N palace	Israel	Cistern	Netzer 1991, 164-169.
234	Masada - abandoned	Israel	Cistern	Netzer 1991, 124-169.
212	Masada - Large	Israel	Cistern; basin	Netzer 1991, 76-101; Ward-Perkins 1981, 313.
236	Masada - Small	Israel		Netzer 1991, 181-183.
289	Petra	Jordan	Dubious identification	Hoss 2005, 46.
204	Ramat Hanadiv/Horvat Eleq	Israel	Aqueduct; reservoir	Hirschfeld 2000, 306-329; Hirschfeld 2002b, 397-8; figs 3a and 8.

14.2 2nd-century AD bathhouses

Site no	Name	Location	Comments	Reference
682	Amman	Jordan		Northedge 1992, 58.
240	Antioch - C	Turkey	Junction box	Fisher 1934, 19-31; Nielsen 1993, vol. 2, 45.
233	Apamea	Syria	Aqueduct	Balty 1981, 53.
203	Auara	Jordan	Aqueduct	Oleson 1991, 51.
244	Dura Europos - F3	Syria	Cistern; basin; latrine #211	Brown 1936, 49-77; Nielsen 1993, vol. 2, 44; Perkins 1973, 27; Pollard 2004, 132-143.
719	En Gedi	Israel	Basin in vestibule	Mazar and Dunayevsky 1967, 142-3.
219	Jerash	Jordan	Aqueduct	Browning 1982, 165, 168; Harding 1967, 86, 91, 99-100; Nielsen 1993, vol. 2, 41.
220	Jerash	Jordan	Aqueduct	Browning 1982, 208; Harding 1967, 86, 91, 99-100.
681	Pella	Jordan	Reservoir (2nd-5th century)	McNicoll 1982, 121-2, 145-6; Smith and Day 1989, 10-19.
694	Scythopolis	Israel	Latrines #699 and #700	Mazor and Bar-Nathan 1998, 20.
720	Sepphoris - E	Israel		Weiss and Netzer 1996, 34.

14.3 3rd-century AD bathhouses

Site no	Name	Location	Comments	Reference
696	Acco	Israel		Tatcher 1998, 12.
238	Antioch - A	Turkey	?Castellum	Fisher 1934, 5-7; Nielsen 1993, vol. 2, 45.
239	Antioch - B	Turkey	Lead pipe; junction box	Fisher 1934, 8-18; Nielsen 1993, vol. 2. 45.
205	Beth Govrin	Israel	Aqueduct	Sagiv *et al.* 2002, 177; Kloner and Cohen 1999, 78*.
256	Bostra - S	Syria	Aqueduct; reservoir	Butler 1919 II.A.4, 260; Nielsen 1993, Vol. 2, 35; personal observation.
214	Brad	Syria	Cistern	Butler 1920 II.B.6, 299f, ill. 330; Nielsen 1993, vol. 2, 46; Ward-Perkins 1981, 326.
246	Dura Europos - C3	Syria	Latrine #247	Brown 1936, 95-100; Nielsen 1993, vol. 2, 44; Perkins 1973, 28.
243	Dura Europos - E3	Syria	Reservoir; *testudo*	Brown 1936, 90-95; Nielsen 1993, vol. 2, 44; Perkins 1973, 27.
225	Emmaus	Israel	Thermal spa	Dvorjetski 1999, 118, fig. 1; Gichon 1979; Hirschfeld 1978; Nielsen 1993, Vol. 2, 41.
202	Hammat Gader	Israel	Aqueduct; lead pipes; thermal spa	Dvorjetski 1999, 118-9, fig. 1; Hirschfeld and Solar 1981; Hirschfeld 1997; Peleg 1991, 134.
721	Hazeva	Israel		Cohen and Israel 1996, 10-116.
687	Horvat Migdal	Israel		Ayalon *et al.* 1989-90, 137.
684	Kefar Nahum (Capernaum)	Israel	Reservoir; aqueduct	Tsaferis and Peleg 1984, 64*.
697	Lejjun	Jordan		Parker 1990, 364.
216	Palmyra	Syria	Latrine #237	Bounni and Asad 1989, 71; Browning 1979, 139-142; Nielsen 1993, vol. 2, 46; Ward-Perkins 1981, 360; personal observation.
689	Sepphoris	Israel		Weiss and Netzer 1994, 43.
264	Sha'arah	Syria		Butler 1907, II.A.7, 439; Nielsen 1993, vol. 2, 46.
241	Shohba	Syria	Aqueduct; reservoir	Brunnow and Domaszewski 1904, 73, 151-60; Butler II.A.5, 359; Krencker 1929, 296; Nielsen 1993, vol. 2, 46; Ward-Perkins 1981, 343; personal observation.
276	Umm Qes	Jordan		Lux 1966, 64-73.
722	Yotvata	Israel		Meshel 1989, 234-236.

14.4 Bathhouses in the 4th to 7th centuries AD

Site no	Name	Location	Comments	Reference
252	Abdeh	Syria		Jaussen and Sauvignac 1922, 112.
275	Andarin	Syria		Butler 1919 II.B.2, 62; Fagan 1999, 90.
260	Antioch - E	Turkey	Latrine #267	Campbell 1936, 1; Levi 1947, 260-261; Nielsen 1993, vol. 2, 45.
277	Ashqelon	Israel	Cistern; lead pipes	Dauphin 1996, 47-72; Stager 1991, 45-47; Israel 1993, 104.
262	Athis – Public	Syria	Latrine #262	Harper and Wilkinson 1975, 329; Nielsen 1993, vol. 2, 46.
261	Athis - Principia	Syria		Harper and Wilkinson 1975, 329; Nielsen 1993, vol. 2, 46.
691	Avedat	Israel		Tahal 1994, 133.
263	Babisqa	Syria		Butler 1907 II.B.4, 170, ill. 180; Nielsen 1993, vol. 2, 46.
692	Banias	Israel	Aqueduct	Tsaferis and Israeli 1996, 13.
242	Beirut	Lebanon		Lauffray 1944-5, 31; Thorpe 1998-9.
207	Beth Yerah	Israel	Aqueduct; junction box	Nielsen 1993, vol. 2, 41; Maisler *et al*. 1952, 218-222; Winogradov 2002, 295.
288	Caesarea	Israel	Reservoir, latrine #286	Horton 1996, 177-189.
695	Caesarea	Israel		Porath *et al.* 1998, 42.
688	Horvat Zikhrin	Israel		Fischer 1993, 40.
271	Jekmejeh	Turkey	Latrine #272	Stillwell 1941, 24-5.
287	Jerash – Baths of Placcus	Jordan	Latrine #285	Fisher 1938b, 265-269.
683	Jerusalem	Israel		Baruch 2002, 75*-76*.
690	Jerusalem	Israel	Reservoir	Reich and Shukron 1994, 95.
257	Kurnub - Bldg V	Israel		Nielsen 1993, Vol. 2, 36.
248	Rama	Israel		Tsaferis 1980; Nielsen 1993, vol. 2, 41.
253	Ruheibeh	Syria		Jaussen and Sauvignac 1922, 112.
685	Scythopolis	Israel	Latrine #693	Mazor 1988-9, 22-24; Foerster and Tsafrir 1992, 38-41.
265	Serjilla	Syria	Cistern, latrine #283	Butler 1907 II.B.118, 121 ills 134-6; Nielsen 1993, vol. 2, 46f; personal observation.
232	Tell Qasile	Israel		Mazar 1973; Mazar 1975.
266	Toprak en-Narlidja	Turkey	Latrine #270. Also known as Baths of Apolausis.	Nielsen 1993, vol. 2, 47; Stillwell 1941, 19-23.
249	Umm Qes	Jordan	Aqueduct; reservoir; *labrum*; lead pipe	Andersen *et al.* 1993; Holm-Nielsen et al 1986, 220-229; Nielsen 1993, Vol. 2, 41.
290	Zenobia	Syria	Well	Lauffray 1991, 125; Orssaud 1991, 248; personal observation.

14.5 Bathhouses of non-specific ('Roman') date

Site no	Name	Location	Comments	Reference
723	Antioch - F	Syria	Latrine #724	Stillwell 1941, 8-9.
725	Apamea	Syria	Aqueduct	Personal observation
726	Apamea	Syria		Personal observation
284	Babisqa – small			Butler 1907 II.B.4, 174.
279	Bostra – central	Syria	?Reservoir; lead pipe.	Butler 1907 II.A.4, 264; personal observation.
280	Bostra – N	Syria		Butler 1907, II.A.4, 264.
281	Bostra – NW	Syria		Butler 1907 II.A.4, 265.
686	Dor	Israel		Stern *et al.* 1988-9, 48.
245	Dura Europos – M7	Syria	Reservoir; *labrum*	Brown 1936a, 86-89; Nielsen 1993, vol. 2, 44; Perkins 1973, 28.
278	Hammam as-Sarakh	Syria	Cistern; well	Butler 1907, II.A.2, 77, ills 59, 60.
223	Hammei Ba-arah/az-Zerqa	Israel		Dvorjetski 1999, 118, 121-2, fig. 1.
221	Hammei Tiberias	Israel		Dvorjetski 1999, 118, 119-121 fig. 1.
222	Hammtha de-Pahel	Israel		Dvorjetski 1999, 118, fig.1.
291	Moudjeleia	Syria	Cistern	De Voguë 1865, 95.
255	Ses	Syria		De Vogue 1865, 71, fig. 28, pl. 25.
282	Si	Syria		Butler 1907, II.A.6, 367, 399.
698	Sidon	Lebanon		Dunand 1967, 39; Doumet-Serhal 1998-9, 184.
206	Susita/Hippos	Israel	Aqueduct	Ben David 2002, 206.
217	Zeugma	SE Turkey	Latrine #217	Early *et al.* 2003, 55f.

Gazetteer 15: Water supply installations in domestic contexts from urban sites

15.1: 1st century BC

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
382	Dura Europos: House J in Block G3	cistern				court J1-2 Covered by square pierced gypsum lid	Brown 1944, 86.
383	Dura Europos: House H in G3	cistern				court H3 Covered by square pierced gypsum slab	Brown 1944, 87.
384	Dura Europos: House D in G3	cistern				court D2 Square pierced gypsum lid	Brown 1944, 89.
		pipe				Ceramic In D3; ?women's chamber Plaster casing 2.28 m high of several sections of terracotta pipe	Brown 1944, 89.
389	Dura Europos: House E in G5	cistern				court E1 Roughly circular pierced gypsum lid	Brown 1944, 112.
390	Dura Europos: House F in G5	cistern				court F1 Roughly circular pierced gypsum lid	Brown 1944, 114.
391	Dura Europos: House C in G5	cistern				court C1 Square pierced gypsum lid	Brown 1944, 117.
392	Dura Europos: House A in G5	cistern				court A1 Roughly circular pierced gypsum lid	Brown 1944, 118.
393	Dura Europos: House D in G5	cistern				court D1 Roughly circular pierced gypsum lid	Brown 1944, 120.
394	Dura Europos: House B in G5	cistern				court B1 Roughly circular pierced gypsum lid	Brown 1944, 121.
395	Dura Europos: House F in G1	cistern				court F109 Rectangular pierced gyspum lid	Brown 1944, 133.
396	Dura Europos: House D in G1	cistern				court D77 Square pierced gypsum lid	Brown 1944, 136.
402	Dura Europos: House D in G6	cistern				court D1 Square pierced gypsum lid	Brown 1944, 157.
486	Jerusalem: the French Hill	well				Deep; plastered	Oren 1972, 172.

15.2: 1st century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
452	Beirut: Bey 006: Area 2	cistern				Rock cut In NW corner of Area 2: courtyard	Perring 1997-8, 21; Perring 2006, 28-30 .
452	Beirut: Bey 006: Area 2	pipe				Lead Feeds courtyard area	Perring *et al.* 1996, 195; Perring 2006, 28-30.
738	Beirut: Bey 006	Cistern				In courtyard	Perring 2006, 28-30.
739	Beirut: Bey 006	Cistern				In courtyard	Perring 2006, 28-30.
739	Beirut: Bey 006	fountain				In peristyle that replaces courtyard at end of 1st century AD/2nd century AD	Perring 2006, 28-30.
479	Dor	gutters				From houses drain into 3 drains in street I	Stern and Berg 1995, 44.
479	Dor	cistern				House in area F	Stern, Berg and Sharon 1991, 50.
400	Dura Europos: House A in G4	cistern				court A57 Square pierced gypsum lid	Brown 1944, 152.
401	Dura Europos: House C in G6	cistern				court C10 Square pierced gypsum lid	Brown 1944, 155.
388	Dura Europos: House H in G7	cistern				court H1 Pierced polygonal gypsum lid	Brown 1944, 106.
424	Petra: Wadi Musa salvage	latrine				To W of hall	Amr *et al.* 1997, 470.
424	Petra: Wadi Musa salvage	baths				Private bath complex	Amr *et al.* 1997, 470.
424	Petra: Wadi Musa salvage	'drainage' system				Under pavement in 'kitchen' Connected to caldarium	Amr *et al.* 1997, 470.
424	Petra: Wadi Musa salvage	foutain				Limestone Lion head fountain found on kitchen floor	Amr *et al.* 1997, 470.
424	Petra: Wadi Musa salvage	septic tank				Marked on plan	Amr *et al.* 1997, 471, fig. 2.
405	Zeugma: Ergec villa	Pipe 1				Ceramic One on top of other in small channel In robber trench	Ergec 1998, 81.
405	Zeugma: Ergec villa	Pipe 2				Ceramic One on top of other in small channel In robber trench	Ergec 1998, 81.
405	Zeugma: Ergec villa	cistern				Below peristyle Opening between two columns on W side Pierced basalt stone at opening Columns on either side have sockets for a pulley Could be accessed from areas 2 and 4 Mouth was covered by brick	Ergec 1998, 80-91.
405	Zeugma: Ergec villa	channel				Stone Diagonally across area 6 Coated with plaster and base lined with ceramic tiles	Ergec 1998, 87.
405	Zeugma: Ergec villa	cistern 2					Ergec 1998, 87.
405	Zeugma: Ergec villa	channel				Originates in area 11 crossing diagonally and forks in area 14	Ergec 1998, 87.

15.3: 2nd century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
428	Antioch: House of the Calendar 15-R	pool				Large triclinium opens onto colonnaded portico and over to pool	Levi 1947, 36.
428	Antioch: House of the Calendar 15-R	channel				'Drain' provides water to pool ?from reservoir	Levi 1947, 36.
428	Antioch: House of the Calendar 15-R	reservoir				Provides water for pool	Levi 1947, 36.
434	Antioch: House of the Porticoes 14-S	pool				Rectangular pool accessible through small stairway on E side	Levi 1947, 105.
397	Dura Europos: House A in G1	cistern				court A10 Square pierced gypsum lid	Brown 1944, 137.
397	Dura Europos: House A in G1	cistern 2				court A39 Square pierced gypsum lid	Brown 1944, 141.
398	Dura Europos: House B in G1	cistern				stair unit B30 Square pierced gypsum lid	Brown 1944, 144.
398	Dura Europos: House B in G1	cistern 2				'closet' B105 Square pierced gypsum lid	Brown 1944, 146.
385	Dura Europos: House B in G3	cistern				court B2 Square pierced gypsum lid	Brown 1944, 94.
385	Dura Europos: House B in G3	cisern 2				court B7 Square pierced gypsum lid	Brown 1944, 95.
386	Dura Europos: House G in G3	cistern				court G1 Square pierced gypsum lid	Brown 1944, 98.
399	Dura Eurpos: House C in G1	cistern				in court C9 Square pierced gypsum lid	Brown 1944, 148.
404	Zeugma: House D	cistern				Large with two entrances One circular opening and one square opening Area around cistern has white tesselated floor Two channels fed cistern: one still had ceramic pipes Possible silt trap at end	Kennedy 1998, 61 figs 4.4; 4.17 a-b.
413	Zeugma: Trench 6: 2000	cistern				Room P2: cistern 6007 Masonry arc of circle next to cistern on top of mosaic 6037 probably channels spare water into channel 6040 under the mosaic	Abadie-Reynal 2001, 261.
413	Zeugma: Trench 6: 2000	channel				Channel 6040, under mosaic in room 2. Possibly joins up with channel 6327	Abadie-Reynal 2001, 261.
413	Zeugma: Trench 6: 2000	channel				Channel 6327	Abadie-Reynal 2001, 261.
413	Zeugma: Trench 6: 2000	channel				Rock cut Channel 6235 = C15 Covered In room 3	Abadie-Reynal 2001, 261-264.
413	Zeugma: Trench 6: 2000	fountain				In room 4 May have been made of marble In middle of mosaic	Abadie-Reynal 2001, 264.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
413	Zeugma: Trench 6: 2000	Fountain				Room 4: E wall [Niche with fountain in it] Fed by channel [only marked on plan] [channels C16 and C17 seem to feed this room from the N]	Abadie-Reynal 2001, 264.
413	Zeugma: Trench 6: 2000	channel				Channel 6015 = C16 Earlier than late walls in room 5 [Seems to feed room 4]	Abadie-Reynal 2001, 264.
413	Zeugma: Trench 6: 2000	Channel				Channel 6267; passes under wall M24 in room 11	Abadie-Reynal 2001, 264.
413	Zeugma: Trench 6: 2000	Channel				Rock cut Could be drain or for removal of rainwater Room 12 (kitchen)	Abadie-Reynal 2001, 264.
413	Zeugma: Trench 6: 2000	channels				Approx. 10 other channels	Abadie-Reynal 2001, 259-272.
413	Zeugma: Trench 6: 2000	cistern				Room 17	Abadie-Reynal 2001, 270.
413	Zeugma: Trench 6: 2000	channel				In room 13	Abadie-Reynal 2001, 270.
413	Zeugma: Trench 6: 2000	channel				Room 15 [seem to be several on plan]	Abadie-Reynal 2001, 259-272.
413	Zeugma: Trench 6: 2000	channel				Room 1; channel 6145= C13	Abadie-Reynal 2001, 270.

15.4: 3rd century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
533	Antioch – Seleucia – Upper City	fountain				Found in *triclinium* of house Niche added at a later date	Stillwell 1941, 5.
533	Antioch – Seleucia – Upper City	basin				Outside N wall of room Shallow basin lined with marble Supplied by lead pipe	Stillwell 1941, 5.
533	Antioch – Seleucia – Upper City	pipe				Lead Supplied water basin Had a bronze valve	Stillwell 1941, 5.
451	Antioch: House of Iphigenia: 14-S	pool				Room 4 Wide and shallow with cemented sides and a cement-coated floor of white mosaic Can be viewed from room 2 (*triclinium*)	Stillwell 1941, 10.
451	Antioch: House of Iphigenia: 14-S	Fountain				Room 1	Stillwell 1941, 10.
451	Antioch: House of Iphigenia: 14-S	pool				Brick Along each side of room1 Marble revetment on top and front Interior coated with cement S pool connected to adjacent pool by hole in bottom	Stillwell 1941, 10; Levi 1947, 119, fig. 48.
451	Antioch: House of Iphigenia: 14-S	pipe				Bronze overflow pipe for E pool in room 1	Stillwell 1941, 10.
451	Antioch: House of Iphigenia: 14-S	spouts				2 bronze lion head spouts for E pool in room 1	Stillwell 1941, 10.
493	Ashqelon	drain				In small patch of floor Capped with amphorae	Stager and Esse 1987, 71.
675	Caesarea: Insula W2S3	pool				In colonnaded courtyard	Porath 2000, 37*.
675	Caesarea: Insula W2S3	cistern				In courtyard to W of colonnaded courtyard	Porath 2000, 37*.
675	Caesarea: Insula W2S3	well				To SW of colonnaded courtyard Filled with domestic refuse when house connected to municipal water system	Porath 2000, 37*.
403	Dura Europos: Palace of *Dux Ripae*	basin	0.35	0.35	0.37	Brick Near E corner of court 58 Court was graded with change of 0.5 m in level from W to E	Detweiler 1952, 8.
403	Dura Europos: Palace of *Dux Ripae*	drain				Stone Extended under SE portico and wall of court 58 On plan seems to lead from brick basin	Detweiler 1952, 9.
403	Dura Europos: Palace of *Dux Ripae*	basin 2				Stone Open surface of court 1 drained towards this basin in the E corner	Detweiler 1952, 12.
403	Dura Europos: Palace of *Dux Ripae*	drain 2				Stone Court 1 leading from basin 2 Under SE stylobate and portico Proceeded beneath N end of court 43 to room 23 where it joined system of drains in this room and room 49	Detweiler 1952, 12.
403	Dura Europos: Palace of *Dux Ripae*	latrine	2.70	1.80		Brick. Room 23 Part of suite of rooms with 49/48 forming bath	Detweiler 1952, 16-17.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
403	Dura Europos: Palace of *Dux Ripae*	latrine drain		0.30	0.43	In room 23 on SW and SE sides Flushed by drain from court 1	Detweiler 1952, 17.
403	Dura Europos: Palace of *Dux Ripae*	bathing room	3.60	3.20		Room 49 with plaster floor Catchbasin in E corner	Detweiler 1952, 17.
403	Dura Europos: Palace of *Dux Ripae*	basin 3	0.35	0.40	0.16	In room 49 Lined with hollow tubuli to prevent large objects going down drain	Detweiler 1952, 17.
403	Dura Europos: Palace of *Dux Ripae*	bath suite 2				To NW of palace and connected with it	Detweiler 1952, 25.
403	Dura Europos: Palace of *Dux Ripae*	latrine 2				Room 44 of bath suite 2 L-shaped and paved with bricks Had drain and gutter in front of seats Seats in horseshoe shape	Detweiler 1952, 26.
403	Dura Europos: Palace of *Dux Ripae*	latrine drain 2			0.45	In room 44 latrine Depth varied from 0.45 - 0.67 m Led to another drain under room 55	Detweiler 1952, 26.
403	Dura Europos: Palace of *Dux Ripae*	cistern				[The palace seems to have had none nor any other provision for water supply, only drainage - maybe these were in the area to the N not excavated]	Detweiler 1952, 26.
473	Sumaqa	cistern 1			4.00	0.5 m away from S wall W23 Opening 0.55 m x 0.75 m Capstone 0.65 m diameter Bell-shaped; not bottomed Plastered	Ben-Ephraim 1999, 54.
473	Sumaqa	cistern 2				5 m NE Opening: 0.5 m x 0.5 m Capstone with locking arrangements for square wooden cover Built stone shaft to 2 m deep then rock cut Probably bell-shaped; not bottomed	Ben-Ephraim 1999, 55.

15.5: 1st century BC – 3rd century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
430	Antioch: House of Cilicia S 19-K	fountain				With semi-circular pool which is later	Levi 1947, 57.
429	Antioch: House of Ge and the Seasons DH 24-P	pool				With rectangular basin in room 1	Levi 1947, 55, fig. 17.
429	Antioch: House of Ge and the Seasons DH 24-P	well				Sealed under upper floor pavement	Levi 1947, 55, fig. 17.
431	Antioch: House of Menander DH 26 M/N House 1	pool				Brick Room 12	Levi 1947, 67; Stillwell 1941, 25f.
431	Antioch: House of Menander DH 26 M/N House 1	pipeline				Ceramic In foreground of photo; seems to be feeding niched pool	Levi 1947, fig. 74.
431	Antioch: House of Menander DH 26 M/N House 1	fountain					Stillwell 1941, 25.
431	Antioch: House of Menander DH 26 M/N House 1	fountain 2				Room 1	Stillwell 1941, 25.
431	Antioch: House of Menander DH 26 M/N House 1	fountain				Several of different periods in court W of *triclinium* 13	Stillwell 1941, 26.
431	Antioch: House of Menander DH 26 M/N House 1	latrine				Described as 'large' To S of *triclinium* 13	Stillwell 1941, 26.
465	Beirut: Bey 008	bathhouse				Private Plastered walls and floors Several conduits	Curvers and Stuart 1996, 232.
465	Beirut: Bey 008	basin				Marble octagonal basin N of bathroom	Curvers and Stuart 1996, 232, fig. 4.
465	Beirut: Bey 008	drainage				Conduits and drains of house connected to central 'sewer' of street	Curvers and Stuart 1996, 232.
379	Dura Europos: E4	cistern				Centre of courtyard 1.2 m diameter opening Cover slab missing Fed by two 'drains'	Hopkins 1936, 7.
379	Dura Europos: E4	channel				Brick Called 'drain' by Hopkins Feeds cistern from room 15, the 'kitchen' Triangular in section and covered with bricks	Hopkins 1936, 7.
379	Dura Europos: E4	channel 2				Brick Feeds cistern from area in front of vestibule 21 Triangular in section and covered with bricks Water was conducted into? this pipe from a brick-paved area via a ceramic pipe made of amphorae	Hopkins 1936, 7.
379	Dura Europos: E4	drain				Brick Box drain beneath step and door sill of 'women's area' Gypsum coated Sloped out into the street	Hopkins 1936, 12.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
380	Dura Europos: House B in C3	channels					Hopkins 1936, 107.
387	Dura Europos: House F in G3	cistern				'Cesspool' in court F4 Square pierced gypsum lid	Brown 1944, 102.
381	Dura Europos: House J in M8	drain				Made of storage jars with bottoms broken off In open court J1	Hoskins 1936, 174.
536	Dura-Europos: House of the Large Atrium	cistern				Rock cut In middle of atrium Collect water from neighbouring roofs	Pillet 1933, 27; Allara 1988, 336.
475	Jerash: near S decumanus	shaft				Circular shaft described as 'well' Leads down to rock-cut reservoir	Gawlikowski 1986, 109.
475	Jerash: near S decumanus	reservoir			4.25	Rock cut Accessed via shaft	Gawlikowski 1986, 109.
475	Jerash: near S decumanus	cistern 1				One of two rectangular cisterns E and W of well	Gawlikowski 1986, 109.
475	Jerash: near S decumanus	Cistern 2				Second of two cisterns E and W of 'well' Stepped Huge jar in floor to facilitate cleaning	Gawlikowski 1986, 109.
475	Jerash: near S decumanus	cistern 3				Linked with one of cisterns E and W of well	Gawlikowski 1986, 109.
475	Jerash: near S decumanus	cistern 4				Has two arches	Gawlikowski 1986, 109.
425	Petra: Az-Zantur	channel				Under flagstone floor in corridor 11	Kolb *et al.* 1999, 266 fig. 9.
425	Petra: Az-Zantur	basin	2.10	2.00	0.80	Stone In simply furnished room 18 Lined with hydraulic plaster, but not connected with supply or drainage	Kolb *et al.* 1999, 268.
425	Petra: Az-Zantur	cistern			3.50	Rock cut Below room 27 Spanned with 4 arches Spill-over channel preserved Waterproof plaster Connected to cistern in room 22 by tunnel Fed by smaller cistern in room 34 too	Kolb and Keller 2000, 363-364; Kolb and Keller 2002, 286-287.
425	Petra: Az-Zantur	channel 2				Spill-over from SE corner of cistern in room 27 Goes through corridor 2, room 12 and corridor 11 and crossed under pavement of room 10	Kolb and Keller 2000, 364.
425	Petra: Az-Zantur	cistern 2				Rock cut Under room 22 (E of room 27] Waterproof plaster Connected by tunnel to cistern in room 27	Kolb and Keller 2000, 364; Kolb and Keller 2002, 286.
425	Petra: Az-Zantur	cistern 3				Rock cut In room 34 Fed water through rectangular opening 1.45 m high and 0.4 m wide to cistern in room 27 and smaller than it	Kolb and Keller 2002, 286.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
425	Petra: Az-Zantur	cistern 4				Small cistern in room 17	Kolb and Keller 2002, 287.
425	Petra: Az-Zantur	bathhouse					Kolb and Keller 2002, 287.
427	Petra: IWFP: Garden triclinium	cistern	4.20	4.00		Covered by three vaulted arches Connected to smaller basin to W	Schmid 2002, 269.
427	Petra: IWFP: Garden triclinium	basin				Connected to cistern to E	Schmid 2002, 269.
492	Sepphoris	cistern				In house that burnt down in 4th century	Strange and Longstaff 1985, 298.
416	Zeugma: Trench 14.2: 2000	drain				Pierces E wall of room E in E direction	Abadie-Reynal 2001, 287.

15.6: 4th century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
438	Antioch: Constantinian Villa: DH 26 K-L	pool				Octaganal pool in room 1	Levi 1947, 226, fig. 86.
438	Antioch: Constantinian Villa: DH 26 K-L	pipe				Seems to feed octagonal pool on plan	Levi 1947, 227, fig. 85.
438	Antioch: Constantinian Villa: DH 26 K-L	cistern				Marked on plan	Levi 1947, 227, fig. 85.
457	Baalbek: villa de Soueidie	cistern				In courtyard Fed by ceramic pipeline	Chehab 1957, 29 .
457	Baalbek: villa de Soueidie	pipelines				Ceramic Under pavement in courtyard One slopes towards cistern	Chehab 1957, 29, pl. XII.12.
457	Baalbek: villa de Soueidie	channel		0.60	0.70	Stone In corridor Covered with slabs Curves in direction of cistern	Chehab 1957, 30.
457	Baalbek: villa de Soueidie	pipeline				Ceramic In corridor Seems to connect with channel	Chehab 1957, 30, pl. XI.4.
454	Beirut: House of Fountains: Bey 006, area 2	fountain 1				In one of two peristyles Supplied by piped water	Perring 1997-8, 22; Perring 2006, 30.
454	Beirut: House of Fountains: Bey 006, area 2	fountain 2				In second of two peristyles Supplied by piped water	Perring 1997-8, 22; Perring 2006, 30.
454	Beirut: House of Fountains: Bey 006, area 2	pipeline				Supplies fountains in peristyles	Perring 1997-8, 22; Perring 2006, 30.
455	Beirut: Bey 006: Area 3	pool				In peristyle with enclosed garden. Central pool	Perring 1997-8, 24; Perring 2006, 30.
407	Zeugma: chantier 5: 1997	basin				Basin surrounded by small stone-built channels These are possibly designed to direct water down to house on lower terrace, but their destination is unknown	Abadie-Reynal 1998, 381.

15.7: 5th century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
435	Antioch: House of the Buffet Supper DH 26/27 O	Fountain 1				In courtyard	Levi 1947, 311; Stillwell 1941, 29.
435	Antioch: House of the Buffet Supper DH 26/27 O	Fountain 2				In centre of same courtyard as fountain 1 Seems to be marked on plan and linked by channel or pipeline to nymphaeum	Levi 1947, 3112, fig. 127.
435	Antioch: House of the Buffet Supper DH 26/27 O	pool			1.00	Brick C101	Stillwell 1941, 29.
440	Antioch: the Yakto complex: DY 17-18 H/I	bathhouse				Possible bathhouse Pipeline in corridor of this area	Levi 1947, 279f; Lassus 1938, 143.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipelines				c. 17 marked on plan	Levi 1947, 280, fig. 110.
440	Antioch: the Yakto complex: DY 17-18 H/I	junction box		0.57	0.63	Seems to be circular junction box linking pipes on plan	Levi 1947, 280, fig. 110; Lassus 1938, 122 fig.42.
440	Antioch: the Yakto complex: DY 17-18 H/I	fountain				Between rooms II and III	Lassus 1938, 99.
440	Antioch: the Yakto complex: DY 17-18 H/I	cistern				Called 'drain'. Room 9 Looks like cistern with pierced rectangular cover in photo	Lassus 1938, 110 fig. 19.
440	Antioch: the Yakto complex: DY 17-18 H/I	basin				In room 9 Probably fed by channel from room 15	Lassus 1938, 110.
440	Antioch: the Yakto complex: DY 17-18 H/I	fountain 2				3 niches: 1 semicircular, flanked by 2 rectangular Marble revetment Basin paved with marble	Lassus 1938, 121.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe		0.05		Lead Feeds basin of fountain	Lassus 1938, 122.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe				Ceramic pipelines associated with circular junction box	Lassus 1938, 122.
440	Antioch: the Yakto complex: DY 17-18 H/I	drain				Under room 21 Receives two branch lines in room 20	Lassus 1938, 122.
440	Antioch: the Yakto complex: DY 17-18 H/I	drainage				Room 20: hole takes waste water away to drain from room 21	Lassus 1938, 122.
440	Antioch: the Yakto complex: DY 17-18 H/I	drain		0.08		Branch to main drain in room 20	Lassus 1938, 122.
440	Antioch: the Yakto complex: DY 17-18 H/I	drain		0.09		Branch drain into main drain in room 20	Lassus 1938, 122.
440	Antioch: the Yakto complex: DY 17-18 H/I	drain		0.40	0.75	Rock cut To W of room 16, passes under basin-like feature	Lassus 1938, `30f, fig. 61.
440	Antioch: the Yakto complex: DY 17-18 H/I	cistern				Vaulted basin with water channel leading to it from S in cour 4	Lassus 1938, 132.
440	Antioch: the Yakto complex: DY 17-18 H/I	cistern 2	10.72	2.90	0.70	Called 'piscine' Next to other vaulted cistern in cour 4	Lassus 1938, 132.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe		0.19		Ceramic Taking water away from cistern 2?	Lassus 1938, 133.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
440	Antioch: the Yakto complex: DY 17-18 H/I	basin				Fragments of marble basin found in court 4	Lassus 1938, 134.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe				Ceramic pipe 1 Room 32 near wall of room 30	Lassus 1938, 140.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe				Ceramic pipe 2 in room 32 Has small hole with 0.08 m diameter pipe branching off: protected by stones	Lassus 1938, 140 fig. 73.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe				Ceramic pipe 3 room 32	Lassus 1938, 141.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe				Ceramic pipe 4 in room 32	Lassus 1938, 141.
440	Antioch: the Yakto complex: DY 17-18 H/I	pipe				Ceramic pipe 5 in room 32	Lassus 1938, 141.
440	Antioch: the Yakto complex: DY 17-18 H/I	latrine	2.42	1.70		Room 34, part of bathhouse suite Has 0.7 m deep channel and narrow, semi-cylindrical channel	Lassus 1938 , 142.
441	Antioch: House of the Masks DH 28/29 N/O	pipelines				c. 6 marked on plan One visible in photo behind mosaic	Levi 1947, 307, figs 125-126.

15.8: 4th century – 7th century AD

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
420	Abila: Tell Abila	channel				Sub-surface and plastered In Byzantine habitation area	Mare 1996, 261.
439	Antioch: House of the Bird Rinceau: DH 28-O/P	pipeline				Shown on plan and visible in background of photo	Levi 1947, 257f, figs 96-97.
378	Apamea: House of console capitals	reservoir 1	14.50	3.00		Occupies peristyle Monumental	Balty 1987, 21.
378	Apamea: House of console capitals	reservoir 2	6.90	3.10		NE corner of house Feeds small latrine	Balty 1987, 21.
378	Apamea: House of console capitals	latrine				Small Fed by reservoir 2	Balty 1987, 21.
378	Apamea: House of console capitals	Basin 1				In peristyle	Balty 1981, figs 138 and 140.
378	Apamea: House of console capitals	Basin 2				In peristyle	Balty 1981, figs 138 and 140.
368	Apamea: House of Consoles	well				NW corner	Balty 1982, 22.
368	Apamea: House of Consoles	cistern	7.65			Built in gallery W of peristyle Marked on plan	Balty 1982, 22; Balty 1987, 21.
376	Apamea: House of Pilasters	reservoir				Hidden from view Feeds fountain and latrine From plan seems to be split into 3 sections	Balty 1987, 21; Balty 1981.
376	Apamea: House of Pilasters	fountain				Semi-circular in Room 1 Fed by reservoir	Balty 1987, 21; Balty 1981.
376	Apamea: House of Pilasters	latrine				Fed by reservoir	Balty 1987, 21; Balty 1981.
377	Apamea: House of Triclinos	reservoir 1	2.00	2.00		SW corner of peristyle Placed against late wall	Balty 1987, 21; Balty 1969, 107.
377	Apamea: House of Triclinos	reservoir 2	3.00	2.00		NE corner of peristyle Placed against late wall	Balty 1987, 21; Balty 1969, 107.
377	Apamea: House of Triclinos	reservoir 3	3.00	2.00		NE corner of room AB	Balty 1987, 21.
461	Beirut: Bey 002	channel				Stone channel 160 N-S Covered with limestone slabs Joined in places by secondary channels at right-angles Covered with hydraulic plaster	Aubert 1996, 76.
461	Beirut: Bey 002	channel				Stone channel 161 N-S Joined in places by secondary channel Covered with hydraulic plaster	Aubert 1996, 76.
461	Beirut: Bey 002	channel				Channel 180 One of the secondary channels	Aubert 1996, 76.
461	Beirut: Bey 002	drainage				Rectangular collector constructed at a lower level to channel 160 to take away excess water	Aubert 1996, 77.
464	Beirut: Bey 026	channels				Stone 'drains' Bottoms plastered Features small basin for cleaning	Bouzek 1996, 139.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
464	Beirut: Bey 026	pipelines				Ceramic Found in fragments	Bouzek 1996, 141.
448	Eboda	cistern				Located in caves	Shereshevski 1991, 41.
444	Kurnub: House I	kitchen					Shereshevski 1991, 27.
444	Kurnub: House I	cistern				Under street, next to entrance of building	Shereshevski 1991, 27.
447	Kurnub: House II	cistern				In centre	Shereshevski 1991, 32.
447	Kurnub: House II	kitchen					Shereshevski 1991, 32.
447	Kurnub: House II	conduit				Leads to cistern	Shereshevski 1991, 33.
445	Kurnub: House XI	cistern				Under courtyard	Shereshevski 1991, 27.
446	Kurnub: House XII	cistern				Under one of rooms around courtyard	Shereshevski 1991, 27.
446	Kurnub: House XII	latrine				Only one in Kurnub and 1st found in Negev On 2nd floor near stable	Shereshevski 1991, 28.
421	Pella: Tell Al Husn	drain				Plot 34B Box drain F25 running into wall 6	Watson and Tidmarsh 1996, 308, fig. 16.
419	Petra: Az-Zantur	channel				On side of houses 1 and 2 Feeds cistern	Kolb and Stucky 1993, 422.
419	Petra: Az-Zantur	cistern				Outside house, because has to built rather than hewn due to local geology (sand) Fed by channel	Kolb and Stucky 1993, 422.
419	Petra: Az-Zantur	channel 2				Channel C in room 6 Ended in silt trap in courtyard 8 [not sure about this interpretation]	Stucky *et al.* 1995, 301.
419	Petra: Az-Zantur	silt trap				In courtyard 8	Stucky *et al.* 1995, 301.
450	Sbeiteh	cisterns				40 cisterns found in house yards	Tsuk 2002c, 68-73.
449	Sbeiteh: 'Pool House'	cistern				With 0.36 m diam opening In courtyard	Shereshevski 1991, 71.
450	Sbeiteh: 'Stable House'	cistern				In SW corner of courtyard near steps to 2nd storey	Shereshevski 1991, 72.

15.9: 'Roman' houses

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
442	Antioch: Barracks House 25-H	pipelines				c. 3 marked on plan	Levi 1947, 316, fig. 131.
442	Antioch: Barracks House 25-H	cistern				Marked on plan	Levi 1947, 316, fig. 131.
436	Antioch: House of the Boat of Psyches DH 23/24 M/N	pool		0.60		Long narrow rectangular basin adorned at one side with five semi-circular niches Mosaic floor	Levi 1947, 185.
414	Antioch: House of the Buffet Supper	fountain				Central	Abadie-Reynal 2001, 264; Levi 1947, 311-312 fig. 127.
414	Antioch: House of the Buffet Supper	fountain				E wall of room	Abadie-Reynal 2001, 264; Levi 1947, 311-312 fig. 127.
437	Antioch: House of the Evil Eye (Jekmejeh)	pool				Central pool	Levi 1947, 219.
437	Antioch: House of the Evil Eye (Jekmejeh)	latrine				Possible latrine	Levi 1947, 219.
437	Antioch: House of the Evil Eye (Jekmejeh)	tepidarium				Possible *tepidarium*	Levi 1947, 219.
432	Antioch: House of the Red Pavement DH 26-M/N	fountain				Room 415 Poss later addition	Levi 1947, 68, fig. 33.
443	Antioch: House of the Sea Goddess S 18-C	pool				In photo	Levi 1947, 349, fig. 142.
433	Antioch: House of Triumph of Dionysos DH 26-K/I	pool				Large semicircular pool separated from *triclinium* by colonnaded hall	Levi 1947, 91, fig. 36.
433	Antioch: House of Triumph of Dionysos DH 26-K/I	pool				Rectangular pool in room 3	Levi 1947, 92.
535	Antioch: S-18-K	fountain				Small fountain at W end of court	Stillwell 1941, 32.
535	Antioch: S-18-K	drain 1				One of two outlets along W edge of *triclinium* Probably connected with drain at S end of colonnade	Stillwell 1941, 33.
535	Antioch: S-18-K	drain 2				Two of two outlets along W edge of *triclinium* Probably connected with drain at S end of colonnade	Stillwell 1941, 33.
535	Antioch: S-18-K	drain 3				Along S edge of E colonnade	Stillwell 1941, 33.
535	Antioch: S-18-K	drains				Found along end of N colonnade	Stillwell 1941, 33.
535	Antioch: S-18-K	drains				Found in square room at W end of court	Stillwell 1941, 33.
372	Sepphoris	bathhouse				Private associated with 'mansion' Area 85.2	Meyers, Netzer and Myers 1988-9, 172.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
372	Sepphoris	installations				Area 86.1. Water installations and drainage channels uncovered in S room W of peristyle in large villa	Netzer and Weiss 1993, 14.
372	Sepphoris	channel				Rock cut In residential quarter	Meyers, Meyers and Hoglund 1997, 264.
372	Sepphoris	pool				In residential quarter 5000 gallons	Meyers, Meyers and Hoglund 1997, 264.
492	Sepphoris	drain				Field 1 villa paved floor with N-S drain below W wall of house: drain runs laong exterior and turns E under external wall to runn along external face of N room in Area I.12	Strange, Groh and Longstaff 1988, 188-9.
492	Sepphoris	pipe				Field 1 villa Cast of ceramic 'drainpipe' in SE corner of area	Strange, Groh and Longstaff 1988, 188.
418	Umm Qes: theatre slope	cistern	14.00	8.00		Under rooms A, B and C and area S of terrace wall M1 in domestic quarter	Kerner and Hoffmann 1993, 368; Kerner 1997, 288.
418	Umm Qes: theatre slope	channel		0.20		In rooms C and D Part of system feeding cistern	Kerner 1997, 288.
410	Zeugma: chantier 10: 1998	basin				SE-NW oriented Constructed against wall Plastered	Abadie-Reynal 1999, 327, fig. 9.
410	Zeugma: chantier 10: 1998	channel				Feeds basin NW-SE orientation	Abadie-Reynal *et al.* 1999, 327, fig. 9.
410	Zeugma: chantier 10: 1998	pipe				Vertical, also feeds basin	Abadie-Reynal *et al.* 1999, 327, fig. 9.
410	Zeugma: chantier 10: 1998	channel				Leaves basin at S corner	Abadie-Reynal *et al.* 1999, 327, fig. 9.
411	Zeugma: chantier 12: 1999/2000	channel				5 outside villa; 2 are earlier than villa	Abadie-Reynal *et al.* 2000, 285, 291.
411	Zeugma: chantier 12: 1999/2000	channel 2				C11; later than C12; in ashy layer covering C12	Abadie-Reynal *et al.* 2000, 245.
411	Zeugma: chantier 12: 1999/2000	channel 3				C12: earlier than C11	Abadie-Reynal *et al.* 2000, 245.
412	Zeugma: chantier 13: 1999	channel				Rock cut 13006 E-W; rectangular section Goes under mosaic to W	Abadie-Reynal *et al.* 2000, 315.
412	Zeugma: chantier 13: 1999	channel 2				Rock cut 13009; right angles to 13006 N-S N: 1.85 m deep S: 0.9 m deep Stops suddenly after the two branches	Abadie-Reynal *et al.* 2000, 315.
412	Zeugma: chantier 13: 1999	channel 3				Rock cut 13018 E Branch off 13009 E-W oriented Covered by stones 13019	Abadie-Reynal *et al.* 2000, 315.
412	Zeugma: chantier 13: 1999	channel 4				13016: another branch off 13009, to W: E-W aligned Has 0.2 m opening onto 13009	Abadie-Reynal *et al.* 2000, 315-317.
412	Zeugma: chantier 13: 1999	basin	1.20		0.70	13028 Receives water from channel 13021	Abadie-Reynal *et al.* 2000, 317.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
412	Zeugma: chantier 13: 1999	channel 5				13021 Feeds basin 13028 Small	Abadie-Reynal *et al.* 2000, 317.
408	Zeugma: chantier 8: 1997	cistern				One of two associated with house Fed by system of ruined channels	Abadie-Reynal *et al.* 1998, 395.
408	Zeugma: chantier 8: 1997	cistern 2				Two of two cisterns associated with house Fed by ruined system of channels	Abadie-Reynal *et al.* 1998, 395.
409	Zeugma: chantier 9: 1998/2000	basin				In room E, but only seen in SE corner Totally covered in mortar Possibly connected to room G Pierced to S by channel	Abadie-Reynal *et al.* 1999, 317.
409	Zeugma: chantier 9: 1998/2000	drain				Curvilinear in room D	Abadie-Reynal *et al.* 1999, 317.
409	Zeugma: chantier 9: 1998/2000	Pipe 1				Ceramic Area to S of 9511 One of two	Abadie-Reynal *et al.* 1999, 317.
409	Zeugma: chantier 9: 1998/2000	Pipe 2				Ceramic Area to S of 9511 Two of two	Abadie-Reynal *et al.* 1999, 317.
409	Zeugma: chantier 9: 1998/2000	Pipe 1				Ceramic One of two pipes found in 2000 in similar area to those found in 1998, but used longer than 1998 examples	Abadie-Reynal *et al.* 2000, 251.
409	Zeugma: chantier 9: 1998/2000	Pipe 2				Ceramic two of two pipes found in 2000 in similar area to those found in 1998, but used longer than 1998 examples	Abadie-Reynal *et al.* 2000, 251.
409	Zeugma: chantier 9: 1998/2000	channel				Stone sondage 1 N-S orientation	Abadie-Reynal *et al.* 2000, 251.
409	Zeugma: chantier 9: 1998/2000	channel		0.40	0.50	Sondage 7 Runs underneath terrace wall Cover stones of wall are 0.8 m wide	Abadie-Reynal *et al.* 2000, 253, fig.1.9.
409	Zeugma: chantier 9: 1998/2000	channel				Brick Sondage 16 This is where some of the pipelines and channels seem to be heading	Abadie-Reynal *et al.* 2000, 255.
409	Zeugma: chantier 9: 1998/2000	'vase'				Limestone Possible fountain above channel in sondage 16	Abadie-Reynal *et al.* 2000, 255.
406	Zeugma: House F	pipe				Ceramic Vertical, set into wall	Kennedy 1998, 79.
415	Zeugma: Trench 16/17: 2000	channel 'a'				Rock cut To E of floor 2	Abadie-Reynal 2001, 272
415	Zeugma: Trench 16/17: 2000	basin	1.90		1.40	Collects water from 4 channels	Abadie-Reynal 2001, 274.
415	Zeugma: Trench 16/17: 2000	channel 1				Rock cut On plan: feeds basin	Abadie-Reynal 2001, 272-275.
415	Zeugma: Trench 16/17: 2000	channel 2				Rock cut On plan: feeds basin	Abadie-Reynal 2001, 272-275.

Site No	Site Name	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
415	Zeugma: Trench 16/17: 2000	channel 3				Rock cut On plan: feeds basin	Abadie-Reynal 2001, 272-275.
415	Zeugma: Trench 16/17: 2000	channel 4				Rock cut On plan: feeds basin	Abadie-Reynal 2001, 272-275.

Gazetteer 16: Water supply installations in domestic contexts from rural sites

Site no	Site name	Date	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
484	Beth She'arim	pre 4th century	cistern 1				In courtyard of house Has 2 parts Part 1: 1.8 m x 1.3 m opening at top with steps leading down to part 2 Part 2: 1.5 m diameter x 1.2 m	Avigad 1955, 207.
484	Beth She'arim	pre 4th century	cistern 2				In courtyard 3 m diameter x 2 m high Not plastered, pillar supports roof	Avigad 1955, 208.
369	Deir ash-Shamir	Roman	cistern				In courtyard	Braemer 1984, 230.
371	En Ya'el, Jerusalem	Late 2nd – early 3rd century	Fountain				Centre of *triclinium* in villa Marble slab with bronze spout Fed by lead pipe	Edelstein 1988-9, 55.
371	En Ya'el, Jerusalem		Lead pipe				Feeds water to villa from springhouse Other segments continue under mosaic in *triclinium* to N	Edelstein 1988-9, 55.
371	En Ya'el, Jerusalem		Bathhouse 1				Upper	Edelstein 1988-9, 56. Edelstein 1990, 40.
371	En Ya'el, Jerusalem		Bathhouse 2				Lower	Edelstein 1990, 38.
371	En Ya'el, Jerusalem		Pool				Open pool between two bathhouses	Edelstein 1990, 40.
373	Horvat Hameshit	Roman	Cistern 1	4.00	4.00	4.50	Cistern A in courtyard between 2 dwellings With a cover	Yron-Lubin 1995, 67.
373	Horvat Hameshit	Roman	cistern 2				In same courtyard as cistern 1	Yron-Lubin 1995, 67.
374	Horvat Raqiq	Late Roman/early Islamic	channel				System of channels and spouts fed water into central courtyard of farmstead	Dagan, 1995, 103.
495	Kh. Mansur al-Aqab	Roman/late Roman	cistern 1				Rock cut Inside enclosed courtyard	Hirschfeld and Birger-Calderon 1991, 88, 99.
495	Kh. Mansur al-Aqab	Roman/late Roman	bathhouse					Hirschfeld and Birger 1991, 90-1.
495	Kh. Mansur al-Aqab	Roman/late Roman	'gutters'				Paved courtyard in W wing	Hirschfeld and Birger 1991, 93.

Site no	Site name	Date	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
495	Kh. Mansur al-Aqab	Roman/late Roman	cistern 2				S slope of site 22 m from walled estate	Hirschfeld and Birger 1991, 99.
495	Kh. Mansur al-Aqab	Late Roman	gutter				In stabling area	Hirschfeld and Birger 1991, 103.
495	Kh. Mansur al-Aqab	Late Roman	cistern 3	10.50	10.50	9.50	Bell-shaped Maximum dimensions given 0.95 m diameter head; dressed kurkar 700 m^3 Reddish plaster	Hirschfeld and Birger 1991, 103 fig. 25.
495	Kh. Mansur al-Aqab	Late Roman	trough	1.70	1.30	0.70	Alongside cistern 3 White mosaic	Hirschfeld and Birger-Calderon 1991, 103.
495	Kh. Mansur al-Aqab	Late Roman	cistern 4	4.00	4.00	3.50	50 m away from cistern 3	Hirschfeld and Birger-Calderon 1991, 103.
495	Kh. Mansur al-Aqab	Late Roman	settling basin				Rock cut Next to cistern 4	Hirschfeld and Birger-Calderon 1991, 103.
422	Khirbat al-Wad'ah	Roman/late Roman	cistern				Each house in village had either a cistern or a was built above or near a cave	Paelumbo *et al.* 1996, 391.
487	Khirbet al-Mureq	Herodian	bathhouse				Private; part of villa	Damati 1972, 173.
487	Khirbet al-Mureq	Herodian	drain				On courtyard stylobate Let water out through break in W wall	Damati 1972, 173.
426	Khirbet an-Nawaflah	4th century	cistern				All houses in village	Amr *et al*. 2000, 239.
375	Lubiye	Roman	cistern				In roofed courtyard Also has shallow conduits	Alexandre 2003, 24*.
668	Ramat Hanadiv: Horvat Aqav	Early Roman - Late Roman	Drain		0.45	0.6	Tower at fortified farmstead Coated with 2 cm thick layer of greyish hydraulic plaster Slopes steeply to N and W	Hirschfeld 2000, 27, fig. 31.
668	Ramat Hanadiv: Horvat Aqav		Drain		0.10	0.10	Locus 120 Also has greyish plaster coating Maybe drained ?stable locus 123	Hirschfeld 2000, 27.
668	Ramat Hanadiv: Horvat Aqav		Cistern	5.35	5.35	5.00	At centre of complex Also used in Late Roman period when covered Rock-cut; bell-shaped Square opening 110 m^3	Hirschfeld 2000, 30, 68, figs 40, 133-4.
668	Ramat Hanadiv: Horvat Aqav		Cistern				Smaller cistern 25 m S of complex Oval; fed by rock-cut channel 50 m^3	Hirschfeld 2000, 30, fig. 42.

Site no	Site name	Date	Element Type	Length (m)	Breadth (m)	Depth (m)	Comments	Reference
423	Sadaqa	AD 574	channel				Dispute over this channel recorded in papyrus	Kaimio and Koenen 1997, 462.
370	Tel Afar	mid 6th century	channels				Plastered masonry channels drained rainwater from courtyards and roofs No water supply traced to building	Porath 1988-9, 1-3.
417	Tell al-Husn	Late Roman	channel				Plot 34A Around N and E perimeters of ?open courtyard	Edwards *et al.* 1990, 78.
417	Tell al-Husn	Late Roman	jars				Water jars also found	Edwards *et al.* 1990, 78.
458	Villa de Jenah	Late Roman	cistern		4.20	5.95	In courtyard A Opening: 0.7 m Fed by channels	Chehab 1957, 54-59, plan no 4.
458	Villa de Jenah	Late Roman	cistern 2		1.20	1.85	In room G 0.45 m diam opening Plastered	Chehab 1957, 54-59, plan no 4.
458	Villa de Jenah	Late Roman	channels				Lots of channels under paving One group directed to cistern in courtyard A Rectangular sections	Chehab 1957, 54-59, plan no 4.
458	Villa de Jenah	Late Roman	pipe	0.40			Under paving Set in a channel 2 segments of ceramic pipe found	Chehab 1957, 54-59, plan no 4.

Gazetteer 17: Mills

Site No	Site Name	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
510	Al Qabu	Roman	mill				[Wikander 1985, 162]
505	Amida	4th century	Literary reference to mill				Ammianus Marcellinus 18.8.11 [Wilson 2001, 231-235]
506	Antioch	Late Roman	Literary reference to mill				Libanius *Or.* 4.29 [Wilson 2001, 235]
517	Antioch	AD73-74	Inscription				Inscription relating to canal for possible fulling mill [Lewis 1997, 96-99; Feissel 1985]
591	Caesarea	4th century or later	mill				Possible turbine mill [Schiøler 1989]
591	Caesarea	Roman	mills				Vertical wheeled mills on dam [Oleson 1985]
705	Diyateh	Roman/Late Roman	mills				Remains of several mills in Diyateh, reputedly Roman or Late Roman according to locals [Sadler 1990, 434f]
508	En Shoqeq	2nd century	dam				Masonry [Wikander 1985, 169]
508	En Shoqeq		mills				Powered by dam water [Wikander 1985, 169]
511	Farod	5th/6th century	*arubah* mills				3 in a series One below other [Wikander 1985, 162; Avitsur 1960]
501	Jerash: saw mill	6th century	channel				Double channel from courtyard of Temple of Artemis Fed two large connected cisterns [Seigne 2002, 206]
501	Jerash: saw mill		cistern				Smaller one of two Header tank for water installation 4 m below in SE corner of subterranean chamber of sanctuary [Seigne 2002, 206]
501	Jerash: saw mill		chamber	8.65	6.65	3.85	Covered with barrel-vault [Seigne 2002, 207]
501	Jerash: saw mill		channel		1.35	2.30	Vertical channel from head race Pinkish mortar lining [Seigne 2002, 207]
501	Jerash: saw mill		wheel race		0.60		Not bottomed Walls made of re-used blocks bonded by lime mortar Carved rectangular spaces for shaft bearings visible; S one shows circular wear traces Position of horizontal shaft of watermill was modified during machine's life +/- 0.14 m [Seigne 2002, 208]
501	Jerash: saw mill		outlet channel				Not explored Probably runs under threshold of E door before turning S to join main sewer of street [Seigne 2002, 208]
501	Jerash: saw mill		column drum 1	1.00	1.00	1.67	4 saw slots penetrating to same depth [Seigne 2002, 208]
501	Jerash: saw mill		column drum 2	1.00	1.00	1.51	2 groups of 4 saw slots separated by 4 preparatory cutting lines Each set penetrates to the same depth [Seigne 2002, 208]
507	Palmyra	Roman	canal				[Crouch 1975, 162]
507	Palmyra		millrace				[Crouch 1975, 162]

Site No	Site Name	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
507	Palmyra		millstone				3 fragments found by Schiøler in vicinity of mills in 1984 [Wikander 1985, 161]
515	Scythopolis	4th – early 5th century	millstone				Upper stone [Wikander 1985, 164]
516	Tiberias: Kerak	Late Roman	Mill				Located at branching off point of basalt pipeline to Kerak from main Tiberias aqueduct [Saarisolo 1927, 79f]
516	Tiberias	late Roman or early Islamic	Mill 1 penstock	0.6	0.6	5.5	Arubah penstock on mill 1. Feeds stone pipe (0.25 m diameter) to create jet. Room containing water wheel: 1.7 m high, with square opening in ceiling (0.6 m x 0.6 m). [Winogradov 2002, 299]
516	Tiberias	late Roman or early Islamic	Mill 2 penstock	0.9	0.9		Arubah penstock on mill 2 [Winogradov 2002, 299]
516	Tiberias	late Roman or early Islamic	Mill				[Winogradov 2002, 299]
516	Tiberias	late Roman or early Islamic	Mill				[Winogradov 2002, 299]
516	Tiberias	late Roman or early Islamic	Mill				[Winogradov 2002, 299]
514	Wadi al Hasa	Roman	arubah mills				Several mills in this area Wikander (1985) has 19, but MacDonald (1980) has only 8.
590	Wadi Faynan	Roman	Mill				Fed by water from large stone-lined reservoir Said to be overshot mill, but must have arubah penstock. [Barker *et al*. 1999, 277, 280]
590	Wadi Faynan		Leat	15.8	0.45	0.4	Stone covered Width and depth similar to intake of reservoir Drops through shaft [Barker *et al*. 1999, 280]
590	Wadi Faynan		shaft	1.5	0.2	0.2	Vertical circular shaft fed by leat Opens up into lower chamber [Barker *et al*. 1999, 280]
590	Wadi Faynan		Lower chamber		1.5	2.4	Roundish lower chamber Possibly housed water-wheel as no evidence for further outbuildings [Barker *et al*. 1999, 280]
512	Wadi Fejjas	Roman	mill 1				On N bank Round depression 1.5 m diam Aqueduct fed (0.75 m wide) from N Place for wheel observed [Saarisolo 1927, 51f; Wikander 1985, 162]
512	Wadi Fejjas	Roman	mill 2				On S bank: 150 m W of mill 1 0.8 m wide x 4 m long aqueduct descends hillside Hollow: 0.61 m diam [Saarisolo 1927, 52; Wikander 1985, 162]
512	Wadi Fejjas	Roman	mill 3				N bank: 150 m further W Quadrangular mill tower with round hollow Seems to be a reservoir assocaited with mill [Saarisolo 1927, 52; Wikander 1985, 162]
513	Wadi Serrar	Roman	mill				N bank of wadi 100 m W of junction of wadis Only traces of square foundations and long wall (4 m high) remain [Saarisolo 1927, 69 fn 1; Wikander 1985, 162]
509	Yarkon	2nd century	mills				[Wikander 1985, 161]

Gazetteer 18: Tanning, dyeing and fulling installations

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
502	Ain Feshka	industrial: misc	4 BC - AD 68	vat				Main vat from which 2 channels leave Probably tanning or velum preparation [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
502	Ain Feshka		4 BC - AD 68	channel 1				One of two from main vat Feeds rectangular and shallow basin Branch of this channel goes around basin to bigger pit [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
502	Ain Feshka		4 BC - AD 68	basin				Fed by channel 1 Rectangular and shallow Drain leaves and feeds plaster lined pit [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
502	Ain Feshka		4 BC - AD 68	pit 1				Larger of two pits Fed by drain from shallow basin Accessed by steps in paved area Lined with plaster [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
502	Ain Feshka		4 BC - AD 68	pit 2				Smaller of two pits Fed by branch of channel 1 Accessed by steps in paved area Lined with plaster [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
502	Ain Feshka		4 BC - AD 68	channel 2				From main vat Goes to rectangular basin to E Two of two channels [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
502	Ain Feshka		4 BC - AD 68	basin 2				Fed by channel 2 Rectangular [De Vaux 1960, 8; Poole and Reed 1961, 114-122]
517	Antioch	fulling	AD73-74	Inscription				Inscription relating to channel for possible fulling mill [Lewis 1997, 96-99; Feissel 1985]
586	Auara	misc (domestic)	late Roman	basin	0.62	0.62		Circular basin Thick base and thin walls perforated by drainage hole installed over channel in floor of room C 3 other basins re-used in bldg Floor = soil, not stone Possibly dyeing, fulling or washing - maybe aimed at military [Oleson *et al*. 1999, 42]
453	Beirut: Bey 006: Area 2	fulling	Mid 4th century	vats				In shops Cement-lined Supplied with piped water [Perring 1997-8, 22; Perring *et al.* 1996, 196; Perring 2006, 32]
453	Beirut: Bey 006: Area 2			pipeline				Supplies water to vats in shops [Perring 1997-8, 22; Perring 2006, 32]
453	Beirut: Bey 006: Area 2			pipes				'Out pipes' in rooms adjacent to courtyard [Perring et al 1996, 195; Perring 2006, 32]
466	Beirut: Bey 008	dyeing	Roman	basin				For dyeing textiles High quantity of murex shells also found [Curvers and Stuart 1996, 229]

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
488	Caesarea	misc	Herodian	tank	35.00	18.00	0.85	E end terraced Steps in NE corner Cut channels at N and S ends link tank to sea Mosaic and columns in surrounding area hint at decoration [Flinder 1976, 77-79]
488	Caesarea			channel 1				At N end of tank; links tank to sea [Flinder 1976, 77]
488	Caesarea			channel 2				At S end of tank; links tank to sea [Flinder 1976, 77]
488	Caesarea			tank 2				Mid way along channel 1 Smaller than tank 1 [Flinder 1976, 77]
488	Caesarea			tank 3				Mid way along channel 2 Smaller than tank 1 [Flinder 1976, 77]
488	Caesarea			channel 3				W end of tank 1 Forked Feeds central one of three tanks [5] [Flinder 1976, 77]
488	Caesarea			tank 4	14.00			One of three shallow and narrow rectangular tanks [Flinder 1976, 77]
488	Caesarea			tank 5	14.00			Central tank of 3 shallow and narrow rectangular tanks Fed by channel 3 [Flinder 1976, 77]
488	Caesarea			tank 6	14.00			Third of three shallow and narrow rectangular tanks [Flinder 1976, 77]
488	Caesarea			channel 4				Leads from tank 1 on SE Possibly goes to sea [Flinder 1976. 79]
488	Caesarea			sluices				Control water flow Each one a stone slab that slides vertically in grooves in channel sides [Flinder 1976, 79]
488	Caesarea			tank 7				Small tank, possibly later Part built, part cut [Flinder 1976,79]
584	Caesarea	misc		reservoir	6.00	5.60		Probable reservoir on shoreline S of Caesarea theatre Plastered on both faces Terracotta pipeline in SW corner [Angert 1994, 138-139]
584	Caesarea			pipeline				In SW corner of reservoir Rested in channel hewn at sea level and partially covered with stone slabs [Angert 1994, 139]
584	Caesarea			pool 1				One of two with plastered floor Remains may belong to industrial process using both sea and fresh water [Angert 1994, 139]
584	Caesarea			pool 2				Two of two; same as pool 1 [Angert 1994, 139]
480	Dor	dyeing?		channel	61.00	0.80		N side of area Due W for 35 m then turns S Enters basin [Raban 1995, 298]
480	Dor			basin 1	6.00	6.00		One of 2 connected buy short narrow water passage Fed by channel [Raban 1995, 298]

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
480	Dor			basin 2	6.00	6.00		Second of two connected by short and narrow passage [Raban 1995, 298]
480	Dor			channel 2				Branch of Nahal Dalia aqueduct from NE that feeds basins [Raban 1995, 298]
480	Dor			channel 3				From W Enters W side of southernmost basin [Raban 1995, 298]
480	Dor			sluices				In two feeder channels [2, 3 and 4] Pairs of vertical grooves [Raban 1995, 298]
480	Dor			channel 4				From S bank of S basin Said to be for drainage, but this is felt to be unlikely Also has grooves [Raban 1995, 298]
480	Dor			basin 3	4.70	3.40	0.30	One of two basins with plastered rubble walls In lee of rock-cut basins [1 and 2] from phase 1 [Raban 1995, 299]
480	Dor			basin 4	4.70	3.40	0.30	Second of two basins with plastered rubble walls In lee of rock-cut basins [1 and 2] from phase 1 [Raban 1995, 299]
480	Dor			channel 5				Feeds basins 3 and 4 from central structure U-shaped and plastered [Raban 1995, 299]
480	Dor			basin 5	13.40	12.00		Plastered basin to N Subdivided into 2 smaller basins External dimensions provided [Raban 1995, 299]
480	Dor			room				Central room with door leading to open courtyard through passage Plaster floor has large spot of bright purple colour [Raban 1995, 299f]
480	Dor			channel 6				Feeds 3 rock-cut basins Leads to NE corner of easternmost one (6) [Raban 1995, 299]
480	Dor			basin 6	4.30	3.50		One of 3 basins on S flank Floor 1.07 m above MSL Fed by channel 6 [Raban 1995, 299]
480	Dor			basin 7	4.20	4.30		Second of three basins on S flank; middle Floor 1.03 m above MSL [Raban 1995, 299]
480	Dor			basin 8	4.70	4.70		Third of 3 basins on S flank; westernmost Floor 0.91 m above MSL [Raban 1995, 299]
480	Dor			tank	9.20	3.40		Water tank in central structure possibly fed channel 7 [Raban 1995, 300]
480	Dor			channel 7		0.30		Possibly fed by tank Curbed, U-shaped, plastered [Raban 1995, 300]
480	Dor			basins				Series of basins adjacent to N wall of tank [Raban 1995, 300]

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
480	Dor			channels				Associated with basins adjacent to N wall of tank Slab-covered; fresh-water [Raban 1995, 300]
480	Dor			grilles				Some stone grilles found [Raban 1995, 300]
480	Dor			basin 9				Built over in-filled tank Associated with new rooms laid on top of tumbled walls after period of no use Plastered [Raban 1995, 301]
480	Dor			basin 10				Another plastered basin to E [Raban 1995, 301]
480	Dor			channel 8				V-shaped [Raban 1995, 301]
497	Gaza: W of synagogue	dyeing?	C5	reservoir 1			0.70	One of 4 large reservoirs in E room All plaster-lined [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 2			0.70	2 of 4 large reservoirs in E room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 3			0.70	3 of 4 large reservoirs in E room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 4			0.70	4 of 4 large reservoirs in E room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 5			0.70	One of 2 small reservoirs in E room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 6			0.70	2 of 2 small reservoirs in E room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 7			0.70	One of 2 large reservoirs in W room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			reservoir 8			0.70	One of 2 large reservoirs in W room [Ovadieh 1969, 197]
497	Gaza: W of synagogue			pipeline				Interconnecting ceramic pipe network in walls between pools Opens towards sea and for drainage [Ovadieh 1969, 197]
497	Gaza: W of synagogue			basins				3 round basins; probably for grinding dyes [Ovadieh 1969, 197]
503	Jerash: hippodrome	misc	Late Roman	vat 1				One of three [Glueck 1934, 6, fig. 2]
503	Jerash: hippodrome			vat 2				Two of three [Glueck 1934, 6, fig. 2]
503	Jerash: hippodrome			vat 3				Three of three [Glueck 1934, 6, fig. 2]
503	Jerash: hippodrome			jars				Four E side of room opposite vats Sunk partially below floor level Plastered inside and out [Glueck 1934, 6]
504	Jerash: *officina tinctoria: macellum*	dyeing	C6 - e C7	vat 1				Type 1 One of three in taberna 11 Plaster-lined: 'coloured pink by contact with some dye' Rectangular; used to immerse cloths Amphorae in bottoms: used to bring water from small cistern in taberna 10 [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			vat 2				Type 1 2 of three of same description in taberna 11 [Uscatestcu and Martin-Bueno 1997, 78]

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
504	Jerash: *officina tinctoria: macellum*			vat 3				Type 1 3 of three of same description in taberna 11 [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			vat 4				Type 1 One of one in taberna 10; same as vats from taberna 11 [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			vat 5				Type 2; one in taberna 12 Semi-circular trough Re-used architectural fragments and lined Function unclear; not deep enough to hold liquid without overflowing Could be used to spread out dyed cloths for enhancement with fuller's earth or dried dyes [Pliny NH 35: 198] [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			vat 6				Type 2 One in exedra 2; same as one in taberna 12 [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			furnace				Only known eg from eastern empire [Uscatescu and Martin-Bueno 1997, 77]
504	Jerash: *officina tinctoria: macellum*			cistern				Small cistern in taberna 10 [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			tank 1				One of two small water tanks in taberna 10 Holes in bottom linked to central fountain via pipes [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			tank 2				Two of two small water tanks in taberna 10 Holes in bottom linked to central fountain via pipes [Uscatescu and Martin-Bueno 1997, 78]
504	Jerash: *officina tinctoria: macellum*			pipeline				Connect water tanks to central fountain in macellum [Uscatescu and Martin-Bueno 1997, 78]
583	Khirbet Ni'ana	misc	Late Roman or earlier	pool 1				L137 Plastered pool One of five Connected to other pools by channels Lead or pottery pipes in walls of pools Paved with mosaic or plaster Possibly used for tanning or textile finishing [Bashkin 1993, 59-61]
583	Khirbet Ni'ana			pool 2				L141 Plastered pool 2 of five 2 steps and 2 steps on rim [Bashkin 1993, 59-61]
583	Khirbet Ni'ana			pool 3				L143 Plastered pool 3 of five Recess in rim for placing cover slab [Bashkin 1993, 59-61]
583	Khirbet Ni'ana			pool 4				L157 Plastered pool 4 of five [Bashkin 1993, 59-61]
583	Khirbet Ni'ana			pool 5				L156 Plastered pool 5 of five [Bashkin 1993, 59-61]

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
583	Khirbet Ni'ana			channel 1				138 One of three connecting pools [Bashkin 1993, 59]
583	Khirbet Ni'ana			channel 2				138A Two of three connecting pools [Bashkin 1993, 59]
583	Khirbet Ni'ana			channel 3				158 Three of three connecting pools [Bashkin 1993, 59]
583	Khirbet Ni'ana			Lead pipes				In pool walls [Bashkin 1993, 59]
583	Khirbet Ni'ana			Ceramic pipes				In pool walls [Bashkin 1993, 59]
581	Khirbet Summaqa	misc		reservoir 1	3.50	3.40	0.95	In large workshop bldg 3 One of two Has mosaic floor 3 steps lead down 2.5 km S of reservoir 2 No channels found connecting the two [Dar 1985, 106]
581	Khirbet Summaqa			reservoir 2	3.40	2.95	0.80	In large workshop bldg 3 Two of two Has mosaic floor 2 steps lead down Sump in corner 2.5 km N of reservoir 1 [Dar 1985, 106]
581	Khirbet Summaqa			reservoir 3	2.90	2.80	1.60	In smaller workshop bldg 5 5 steps and stone wall on 3 sides [Dar 1985, 106]
579	Sarafand	misc		basin 1	4.50	4.00		One of four Floor 0.28 m BSL N wall of each basin: rock-cut opening with pair of notches for sluice gate to control water flow between basins; sluices did not go to full height of channel walls Width of sluice setting: 0.58 m Not for holding sea water- unless sea level 1 m higher than present Must have been filled by run-off from hill to S or from spring in area Maybe for fresh water for ships or possibly associated with dyeing industry [Pritchard 1971, 47-48]
579	Sarafand			basin 2	6.00	2.50		Two of four Floor 0.15 m BSL [Pritchard 1971, 47-48]
579	Sarafand			basin 3	6.00	2.00		Three of four Floor 0.07m BSL [Pritchard 1971, 47-48]
579	Sarafand			basin 4	6.00	5.00		Four of four Floor 0.07 m BSL [Pritchard 1971, 47-48]
579	Sarafand			basin 5	0.80	0.60		Cut into NE side of basin 1 Small opening by which water could flow into small basin [Pritchard 1971, 47-48]
582	Scythopolis	fulling	Late Roman	basins				In basilica area Possibly connected with linen industry as attested by literary sources for Scythopolis from 3rd century onwards [Foerster and Tsafrir 1992, 7]
582	Scythopolis			pipes				In basilica area [Foerster and Tsafrir 1992, 7]

Site No	Site Name	Installation Type	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
580	Tel Yizre'el	misc		conduit	13.00	1.00		Took water from cistern Rock cut and masonry Fed small pool [Yogev 1988-9, 193]
580	Tel Yizre'el			cistern				Fed conduit [Yogev 1988-9, 193]
580	Tel Yizre'el			pool			1.00	Small pool at end of channel In area with white mosaic surface and enclosed with parapet Possibly used in tanning or dyeing process [Yogev 1988-9, 193]
740	Tyre	dyeing		vats				Several large circular rock-cut channels, some connected by narrow rock-cut channels. Some filled with concretions of *murex trunculus* shells. [Wilde 1840, 378-80; Appemdix M, 629-644]
499	Zeugma: Cave A	misc	5th-7th century	basins				Similar to basin found in Cave C [Abadie-Reynal *et al.* 1997, 355]
499	Zeugma: Cave A			channels				Criss-cross floor of caves; same as Cave C [Abadie-Reynal *et al.* 1997, 355]
498	Zeugma: Cave C	misc	5th-7th century	basin	1.00	0.45		At foot of niche Catches water percolating through niche (evidenced by calcite formations on niche walls) [Abadie-Reynal *et al.* 1997, 355]
498	Zeugma: Cave C			channels				Criss-cross floor of caves Rectangular section Varying dimensions All angle down to mouth of caves and Euphrates Some had ashy charcoal fill [Abadie-Reynal *et al.* 1997, 355]

Gazetteer 19: Fishponds (*vivaria*)

Site No	Site Name	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
588	Andarin	Byzantine	reservoir	61.00	61.00	3.00	Also functioned as an irrigation reservoir Fishpond use suggested by series of rectangular recesses at base of walls possibly 220 recesses Qanat provides circulating water Possibly for catfish - some catfish bones found in bathhouse excavation [Mango 2002]
578	Beirut: Bey 007	Roman or Byzantine	vat 1	5.00	3.00		E area of site One of two *opus signinum*-lined vats 10 steps between vat structures lead down to natural cove Possibly holding tanks for holding catch after return of fishing vessels Proximity to cove and flight of steps Several phases of use Truncation in area means impossible to know if associated with building or structure [Thorpe 1998-9a, 36-38]
578	Beirut: Bey 007		vat 2				E area of site One of two *opus signinum*-lined vats [Thorpe 1998-9a, 36-38]
490	Caesarea	6th century	tank	4.00	4.00	2.50	60 jars Fish bones found in pond [Ayalon 1979, 179] Jars set horizontally into walls [Mango 2002, 325]
481	Dor		basin	3.00	2.00	0.83	E basin One of pair of basins on S side of promontory of tell 0.37 m wide partition wall along long side Narrow channel enabled access of wave-initiated flow of sea water into basins [Raban 1995, 343]
481	Dor		basin	3.00	2.00	0.40	W basin Second of pair of basins on S side of promontory of tell [Raban 1995, 343]
482	Dor		basins				2 pairs of almost identical units on W side of peninsula on other side of S bay from #481 [Raban 1995, 343]
483	Dor: Dor Island	late Roman	piscina				Larger and more sophisticated than #481 and 482 2 main rock-cut basins one behind the other [Raban 1995, 343]
483	Dor: Dor Island		basin: front	5.90	2.80		Floor 0.6 m above MSL Has rectangular extensions on NE side with passage leading to chamber with a staircase [Raban 1995, 343]
483	Dor: Dor Island		basin: back	3.60	2.10		Floor 1.9 m above MSL [Raban 1995, 343]
489	Khirbet Sabiya	Byzantine	tank	9.50	5.00		Almost 300 storage jars set horizontally in wall with openings facing centre of room forming 3 rows of small round cells Plastered [Ayalon 1979, 175-177; Mango 2002, 325]
489	Khirbet Sabiya		pit	1.20	0.80	0.55	In middle of floor Walls plastered; floor tiled [Ayalon 1979, 176]
706	Sataf	Roman or Byzantine	pool				Pool from spring flow tunnel at Ein Bikura had two rows of ceramic jars in its sides with mouths towards pool [Gibson *et al.* 1991, 41, fig. 18]
496	Tel Tanninim	4th century or later	pipeline				Channel E of main Caesarea aqueduct On stone ramp at terminus attached to S wall of reservoir [Stieglitz 1998, 57-8]

Site No	Site Name	Date	Element	Length (m)	Breadth (m)	Depth (m)	Comments
496	Tel Tanninim		reservoir	13.60	5.44	2.72	Plaster-lined and covered with sinter External dimensions: 15 m x 7.5 m Steps W wall > plastered floor [Stieglitz 1998, 58]
496	Tel Tanninim		settling basin	0.90	0.90		Round terracotta basin in SW corner as settling tank Sinter: 0.05m thick [Stieglitz 1998, 58]
496	Tel Tanninim		piscina				Extends S from reservoir Steps in SW corner Plastered interior 16 Gaza amphorae embedded lengthwise in mortar casing with each jar base inserted into mouth of adjacent one Each amphora had rectangular opening in centre [Stieglitz 1998, 63-4]
496	Tel Tanninim		settling tank	0.75			Elliptical settling tank in middle of piscina floor [Stieglitz 1998, 63]