

Archaeological Historic Building Record
Grundcruie Water Treatment Works
Methven
MV05



Water Treatment Works, looking N

**ARCHAEOLOGICAL HISTORIC
BUILDING RECORD
GRUNDCRUIE
WATER TREATMENT WORKS
METHVEN
MV05**

<i>1</i>	<i>Background.....</i>	<i>1</i>
<i>2</i>	<i>Details of Work.....</i>	<i>1</i>
<i>3</i>	<i>Bibliography.....</i>	<i>4</i>
<i>Appendix 1</i>	<i>Features Register.....</i>	<i>4</i>
<i>Appendix 2</i>	<i>Photographic Register</i>	<i>6</i>
<i>Appendix 3</i>	<i>Discovery & Excavation in Scotland Entry.....</i>	<i>9</i>

Front cover: Water Treatment Works, looking N.

Illustration 1: Location

Illustration 2: Site Plan

Illustration 3: Plan

Illustration 4: (photo) North elevation, with Tank Cover 37 in foreground

Illustration 5: (photo) East elevation

Illustration 6: (Photo) Interior, E, with Mixer 38 and other machinery

Illustration 7: (Photo) Detail, mixing arms inside Mixer 38.

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ABSTRACT

Following the record of Grundcruie sawmill (Site Code MV04), near Methven, on 17th March 2017, Alder Archaeology expanded the record of the adjacent water treatment works (Site Code MV05). This was funded by the owner in advance of conversion to holiday accommodation. The water treatment works is a small rectangular building of mid-20th-century date, containing a variety of water treatment machinery, and appears to have provided the water supply for the nearby settlement of Methven. An enigmatic concrete structure in the woods to the W may also have been part of the system, or else perhaps a WWII defensive feature.

1 Background

1.1 Introduction

Mr Martin Cameron commissioned Alder Archaeology Ltd to undertake an archaeological standing building record of the Grundcruie Water Treatment Works, Methven. This small building is to be converted to a holiday chalet. It is located in a field about 1.5 km NW of Methven, on the N side of an unclassified road that runs from Methven to Glenalmond, centred at NGR NO 0070 2658. This is about 70 m W of Grundcruie Sawmill, centred on NGR NO 0077 2660, and surveyed on 17th March 2017 (site code MV04), prior to demolition.

The present report is in effect a continuation of the 2017 survey, which was designed to satisfy the archaeological condition on development application reference 16/00438/FLL. The conversion of the building to a holiday chalet is the subject of development application reference 18/00813/FLL.

1.2 Aims and Objectives

The main aim of this investigation was to record the details of the water treatment works before it was converted to holiday use.

1.3 Reporting

The present document has been prepared as the final report on this recording project. Copies will be sent to the client, Historic Environment Scotland and Perth and Kinross Historic Environment Record.

1.4 Acknowledgements

We wish to thank Mr Martin Cameron who funded this project and guided the author around the site. Sophie Nicol of Perth and Kinross Heritage Trust provided guidance.

2 Details of Work

2.1 The Site (Illus 1)

Grundcruie Water Treatment Works stands in a field on the N side of the unclassified road from Methven to Glenalmond, about 1.5 km NW of Methven. Grundcruie farm steading lies about 50 m S, on the S side of the road. The field slopes down gently from W to E, and also from S to N, before dropping quite sharply to the Carse Burn, which here flows from W to E. N of the Carse Burn the ground rises steadily to form a substantial range of hills. The undulating terrain strongly suggests glacial geology, with no obvious solid outcrops.

The Water Works stands just S of the road, set back about 5 m, very slightly below the level of the road, overlooking the line of the burn and the site of the former mill.

2.2 Archaeological Interest

The building is apparently of mid-20th-century date, but at the time of visiting still contained the remains of much of the water treatment machinery. It had obviously been out of use for some time, and this type of small-scale localised water treatment has tended

to be replaced by larger, more centralised systems, so it was worth a brief record before it was stripped out.

2.3 Archaeological Method

The site was walked over by the author in company with the owner, and then extensively photographed digitally, inside and out, with descriptive notes. Photographs were also supplied by the owner. Interpretive plans and elevations were prepared, based on those supplied by the architects, redrawn with detail from the photographs and annotated with information gathered on site.

This part of the investigation concentrated on the Water Works building, and an immediately adjacent tank to the N. Note was also taken of possible water-related concrete features S of the road, outwith the development area.

The features observed are described in detail in Appendix 1 Context Register, and Appendix 2, Photographic Register. What follows is an overview. As some of the features and photographs had been numbered in the 2017 survey, those numbers were retained, and additional, higher numbers given to new features, to assist cross-reference between the two surveys.

2.4 Description

Exterior

The Water Treatment House 34 is a simple rectangular building, 8 m x 4.5 m (about 25' x 15'), aligned nominally W – E, though strictly WNW – ESE. The external walls are covered with grey rough-cast cement render. There is a central door in the S wall, flanked by windows on either side, three small, high windows in the N wall, and single windows in the E and W walls. All the windows have concrete sills.

The roof is of mansard form, with uniform courses of slates, and red ceramic ridge tiles. The gutters are cast-iron, half-round in section, and four courses higher on the short end walls than on the long side walls. The end wall gutters wrap slightly round the corners to spill onto the slates of the long side roofs, while the long side wall gutters drain into cast iron downpipes.

About 3 m to the N of the Water Treatment House 34 is a mainly concrete deck 37 over what appears to be a reservoir or perhaps a settling tank, about 3.8 m x 3.2 m, its edges formed by red colliery bricks. A loose example bore the stamp AIRDRIE. The E end of the deck was covered with wooden planks.

Interior

Internally, the Treatment House 34 contained various items of water processing machinery. Most notable was a mixing drum 38, of riveted steel painted blue, with an arrangement of mixing arms or paddles inside, presumably for mixing soluble chemical powders into the water. The riveted construction strongly suggests a mid 20th-century date; compare for example the boilers of 1950s and early 1960s steam locomotives. Riveting has almost entirely been superseded by welding in modern pressure vessels. An arrangement of concrete blocks to the W suggested the base of another similar machine, now removed.

Other machinery included upright steel or cast-iron cylinders, 42 and 43, with various pipes and valves attached. Their heavy construction suggested high pressure. They could have been used to inject a measured volume of water (or a chemical solution) into the system, by feeding compressed air into the top of the cylinder, or to stabilise water pressure in the system, using a volume of compressed air in the upper half of the cylinder to absorb pressure surges or smooth out the pulsating output of a mechanical pump and avoid damage to water mains.

Other equipment included wooden bins 44 in the SW corner of the building, still containing traces of white powder, probably water treatment chemicals, a possible pressure gauge 45, a water tap and drain 46, and an enamelled work top 47, perhaps for preparing, processing and perhaps boiling water samples.

The exact working of the plant was not obvious. Many parts and connections were missing. Its functions probably included preparing and adding measured solutions of chlorine compounds, to disinfect the water, and also adding a weak alkaline solution to neutralise the natural acids (a common condition in Scotland) which would otherwise tend to dissolve domestic water pipes and contaminate the supply with lead compounds, also a recognised public health problem in 20th-century Scotland.

Curiously absent was any obvious pumping machinery, or any place where it might have been installed, or signs of a heavy-duty electricity supply. It may be that these systems had been very thoroughly dismantled and removed. On the other hand, it may be that the system worked entirely by gravity, and did not require pumping. Outside the entrance door, towards the road, were the tops of two large shutoff valves 40, accompanied by enamel plaques 'SV' on the outside wall of the building. Perhaps one was to let water into the building, and the other to allow treated water out.

Concrete Structure 39

An enigmatic and very overgrown concrete structure 39 was previously found in the woods on the S side of the road, while investigating the possible sources of Upper Mill Lade 32.

The concrete was much overgrown with moss, and had an open, porous fabric, with a rounded natural pebble aggregate, quite different from the dense vibration-compacted structure and angular aggregate of modern concrete. Directly beside the concrete, set in the ground, was a metal fitting with a ferrous rust colour, but a smooth surface. It could have been of bronze or a special alloy steel. The rounded profile and curves of the metal suggest hot forging, not casting, pressing or cutting. Attached to it was a threaded rod with a square nut (not hexagonal), suggesting a mid 20th century date or earlier.

From their style of construction, these features might have been a WWII defensive structure, guarding the bridge over the Carse Burn, but they could instead have served to collect water from the burn and send it by gravity in a pipe down to the Treatment House. After treatment, the water could very easily have descended by gravity in a pipe under the road, all the way to Methven, with more than enough pressure for ordinary domestic supply. The general scale of the Treatment House and its equipment would probably have been about right to supply needs of a small settlement like Methven.

3 Bibliography

Bowler, D. P. 2017 Grundcruie Saw Mill, Methven, Archaeological Historic Building Recording, Written Scheme of Investigation. Alder Archaeology Ltd, Perth.

Bowler, D. P. 2018 Grundcruie Saw Mill, Methven, Archaeological Historic Building Record. Alder Archaeology Ltd, Perth

Malone, S. 2017 Terms of Reference for Historic Building Recording, Land 70 Metres North East Of Grundcruie, Methven. Perth and Kinross Heritage Trust, Perth.

Appendix 1 Features Register

<i>No:</i>	<i>Description</i>
01	Red brick mill chimney.
02	Mill House. Large rectangular masonry building, ground and first floor, set into slope of ground.
28	Stone-built annexe to S of Mill House 02, adjacent to Chimney 01. Presumed boiler or engine house.
31	Lower lade at foot of N Wall 04 of Mill House 02. Approximately 1.4 m wide at base, 2.4 m wide at top. 0.35 m deep. Starts 0.4 m out from N wall 04. Continues to junction with Carse Burn.
32	Upper Lade. Visible only as dry grassy earthwork. N edge not well defined. Runs W – E across site. W end disappears under public road N of Water Treatment House. E end obscured by Grassy Ramp 33, but heads towards NW corner of Mill House 02, at first floor level. Perhaps continued in timber structure now missing. Could have powered overshot wheel, falling to Lower Lade 31. Source of Lade not clearly visible in woods to S and W of public road, but could have led back to meanders of Carse Burns, with some sort of weir now missing.
34	Water Treatment House. Rectangular building with rough-cast cement render. Slated mansard roof, eaves and gutters higher on short ends. Central door in S wall, flanked by windows on either side. Three small high windows in N wall. Single windows in E and W end walls. Contains disused water treatment machinery, and wooden bins with remains of white powder, probably treatment chemicals, for example to neutralise acid or kill bacteria.
37	Rectangular platform to S of Water Treatment House 34. Apparently cover over reservoir tank. Mostly concrete, with wooden planks at E end. Tank is located centrally behind Water Treatment House, 3 m (= 9.5') N of N wall (edge to edge). 3.8 m E-W x 3.2 m N-S = 12.5' x 10.5'. Colliery bricks forming edges of tank, and lying loose on surface, stamped AIRDRIE.
38	<p>A riveted steel drum, painted blue. About 0.75 m diameter, about 1 m high, standing on four concrete blocks, painted green. Large oval opening in centre of drum, about 150 mm x 200 mm, with cast iron flange and 16 bolt holes. On top of drum, inspection / cleaning / filling hatch secured by single clamp and nut. Above drum, a stack of cast-iron valves and flanged junctions, surmounted by iron or steel capstan wheel, turning a central spindle, connected to internal iron and steel mixing arms.</p> <p>Internally, Six triangular section mixer arms bolted on to square central shank. Each arm carries two (top and bottom arms) or four (middle arms) tapering steel or iron prongs, about 15 mm diameter, pointing up and down. All apparently rotated by turning the steel capstan wheel above.</p>

	Probably for mixing treatment chemicals into water.
39	Concrete structure in woods to S of road. Much overgrown with moss. Open, porous fabric, with rounded pebble aggregate suggests WWII or similar age concrete, not modern vibration-compacted concrete. Could be lade feature, or part of WWII roadside defensive structure. A metal fitting adjacent to concrete structure has ferrous rust colour, but smooth surface. Bronze? Special alloy steel? Rounded profile and curves suggest hot forging, not casting, pressing or cutting. Square nut on threaded rod. Part of WWII gun mounting or sighting slit?
40	Two shutoff valves in ground just E of entrance door of Treatment House 34. See also 'SV' plaques on front wall, image 145. Tapered square shanks. Cast iron or forged steel.
41	Ceramic trough 41 on brick piers against N wall to E of Mixer 38. Glazed interior
42	Small black metal cylinder below Trough 41. Cast iron? About 0.3 m diameter, about 0.5 m high. Top and bottom closed with thick steel or cast iron plates, bolted on to flanges. Suggests high pressure. Small valve just above bottom flange, connected to rubber hose. Similar valve just below top flange. Two cast-iron brackets bolted to top plate, either side of central plug, perhaps removable. Vent plug? Fixing location for pressurising apparatus? Water pressure stabiliser? Pressure injector?
43	Tall dark cylinder 43 in SE corner. Probably cast iron, about 2 m long, 0.5 m diameter. Top closed with thick steel plate, bolted down. Opening about 100 mm diameter cast in mid point of N side of cylinder, closed with steel or cast iron blanking plate, bolted on. Base of cylinder set in square sump or well in concrete floor. Various small pipes and inlet valve at base. Small (about 15 mm) pipe outlet on top of cylinder with three branches. Vent or sample point? Connections broken. May connect to small (about 20 mm) pipe on wall to right of cylinder. Medium (about 30 mm) diameter vertical pipe to R of cylinder, with two connections screwed into side of cylinder, about 0.5 m below top and 0.5 m above bottom of cylinder, each controlled by a shutoff valve with a large lever. Steel pipe with cast steel or iron connectors, screwed together. Pipe continues down into sump in floor. Horizontal pipe (about 20 mm) against S wall at floor level, with open junctions to vertical pipes (missing), and round shutoff valve with square shank. Inclined steel ladder bolted to cylinder.
44	Low wooden bins in SW corner of building, containing traces of white powder. Probably treatment chemicals.
45	Apparatus fixed to S wall, near Cylinder 43, with broken vertical glass tube and open connections. Manometer? Water level gauge? Appears low pressure.
46	Water(?) tap and drain on E end wall. To extract and discard water samples?
47	White enamelled work top against E end wall. Stands on metal legs, with central drain or gas pipe? and two three-block supports for vessels. Used to process or heat samples? White enamel or ceramic splash back. Two triangular plates on splash back, purpose unknown.

Appendix 2 Photographic Register

<i>Image No</i>	<i>Description</i>	<i>View</i>
	17th March 2017	
001	From public road. Water treatment house 34 by roadside to NW. Mill Chimney 01 to R.	NNW
004	From E. Chimney 01 with overgrown buildings to N, set into slope. Water Treatment House 34 in background.	WNW
035	Old Mill House 02, with Water Treatment House 34 in distance to R.	S
064 – 6	Boiler House 28 and Mill Chimney 01, with Water Treatment House 34 in distance.	WSW
081	Boiler House 28 and Mill Chimney 01, with Water Treatment House 34 in distance.	WSW
103	From mill upstream along Carse Burn. Water Treatment House 34 on L.	WSW
104	From Carse Burn up to Water Treatment House 34 and upper lade 32.	SW
109	W upstream along Carse Burn. Water Treatment House 34 on L.	W
112	From mill along upper lade to Water Treatment House 34.	WSW
113	Water Treatment House 34 Surrounded by mature trees.	SW
115 – 6	Back along Carse Burn to mill. Water Treatment House 34 on R.	E
122	Looking back along Carse Burn to mill. Water Treatment House 34 beside road.	E
123 – 4	Looking back along road to Water Treatment House 34.	ESE
125 – 6	Looking back along upper lade 32 to mill. Water Treatment House 34 on R.	E
127 – 8	Along road from Water Treatment House 34.	W
129 – 30	W end of Water Treatment House 34. Rough cast render, and single central window with concrete sill. Upper half of window with green painted frames, six panes, and hinged panel at top. Lower part boarded over. Slated mansard roof, with eaves and gutters higher on end walls. Half-round cast iron gutters. Slated roof with 17 uniform courses. Reservoir tank 37 to L.	ESE
131	Detail, reservoir tank 37. Brick and concrete surrounding walls, flat concrete deck, with timber deck at E end.	ENE
132	Detail of colliery brick on tank cover. AIRDRIE in frog.	
133	N elevation of Water Treatment House 34, with Water Tank 37 in front. N wall rough cast render with three small, high windows, with concrete sills. Green painted frames with six panes. Slated roof with 21 uniform courses. Red ridge tiles, with overlapping joints. Single downpipe from gutter at E end of wall.	SSW
134	E elevation of Water Treatment House 34, with Water Tank 37 to R. E wall similar to W. Window mostly boarder over, except for top three panes.	WNW

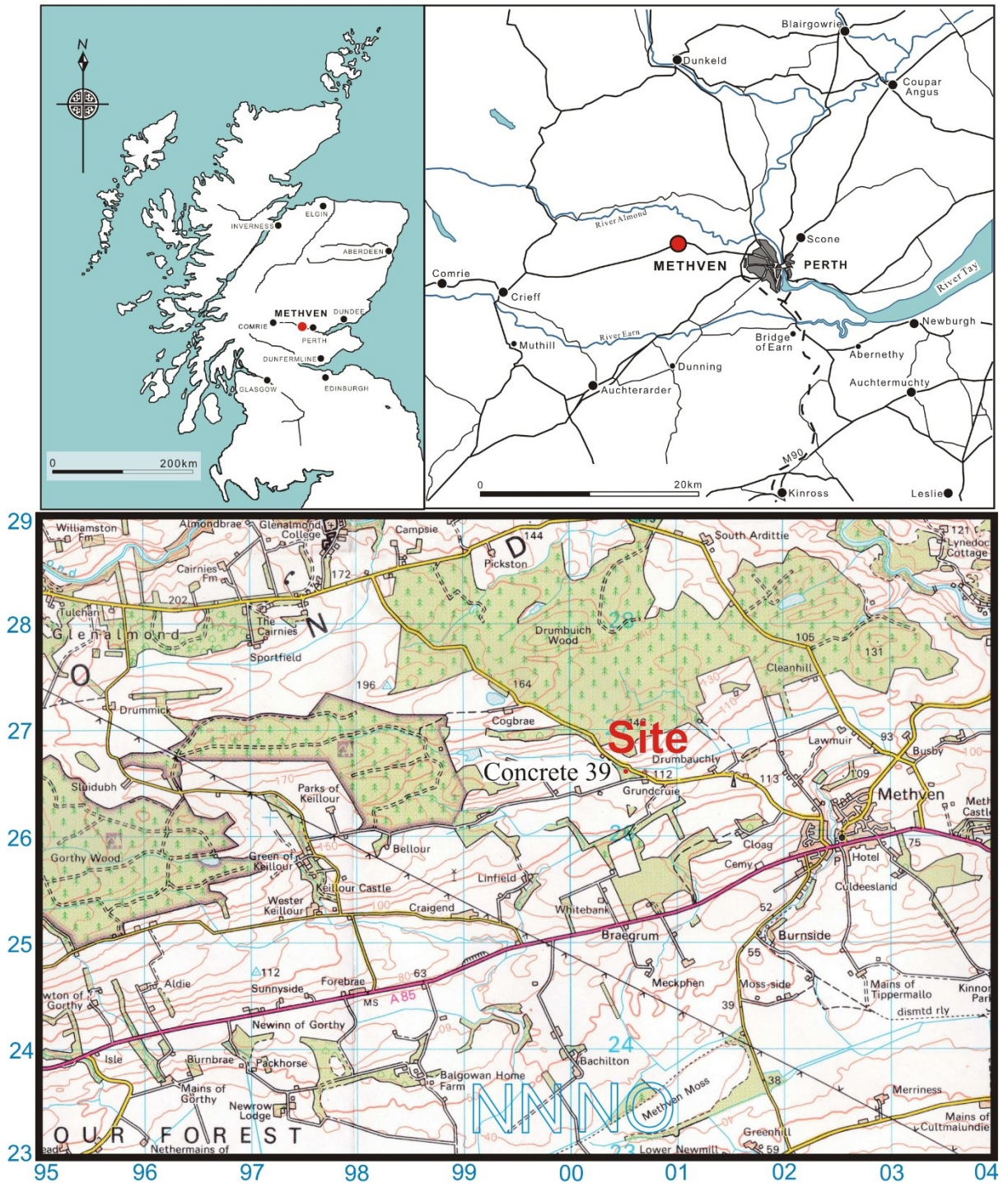
135	SE corner of Water Treatment House 34. Mansard roof with overhanging eaves. Higher eaves on shorter ends. Gutter on end walls spills onto side roof slates, thence into side gutter.	NW
136	Shutoff valves 40 in ground in front of Water Treatment House 34. See also Image 145. Presumably control flow into and out of treatment house, from pipes under or beside public road.	SW
137	Interior. Blue Water Treatment Mixer 38, with N wall of building behind and three high widows. Walls painted cream. Window frames white. Bare concrete floor with leaf litter, and various broken pipes. Ceramic trough 41 on brick piers to R of Mixer 38. Small Cylinder 42 below Trough 41.	N
138	Interior. Treatment Mixer 38 and other machinery. Mixer 38 is a riveted steel drum, about 0.75 m diameter, about 1 m high, standing on four concrete blocks, painted green. Four more blocks to L of Mixer suggest position of similar machine, now lost. Large oval opening in centre of drum, about 150 mm x 200 mm, with cast iron flange and 16 bolt holes. On top of drum, inspection / cleaning / filling hatch secured by single clamp and nut. Above drum, a stack of cast-iron valves and junctions, surmounted by iron or steel capstan wheel, turning a central spindle.	NE
139	Interior. White coombed ceiling. Internal view of boarded up E window. Treatment mixer 38 and other machinery. Tall dark Cylinder 43 on R perhaps pressure stabiliser. Foreground right, corner of low wooden bins 44 containing traces of white powder.	SE
140	Detail of Cylinder 43. Compare image 275 below.	SE
141 – 3	Detail of Treatment Mixer 38. Detail of flange on oval opening. Mixer blades inside oval opening. Six triangular section mixer arms bolted on to square central shank. Each arm carries two (top and bottom arms) or four (middle arms) tapering steel or iron prongs, about 15 mm diameter, pointing up and down. All apparently rotated by turning the capstan wheel above.	NE
145	S elevation of Water Treatment House 34, facing public road. Central entrance door, with two leaves of vertical boards. Three-pane window above. Two large windows either side of entrance door, with concrete sills, and remains of nine-pane window frames. Top three panes hinge for ventilation. Gutter downpipe at E end of wall. All details painted green. Low wooden fence in front of building, five unpainted timber rails. Remains of wooden gate in front of entrance door. Two 'SV' plaques on wall indicate position of shutoff valves 40 (Image 136).	NE
146 – 7	View along road from convergence of upper lade towards Treatment House 34.	ESE
148	Concrete structure 39 in woods to S of road. Water related or WWII?	N
149	Concrete structure 39 in woods to S of road. Water related or WWII?	E
150	Metal fitting adjacent to concrete structure. Bronze?	
155	General view back to mill from bridge over Carse Burn. Treatment House 34 in distance.	E
156	General view back to mill from beyond bridge over Carse Burn.	ESE

	25 March 2017 (Supplied by Martin Cameron)	
272	Left, detail of treatment mixer 38, with mainly riveted construction. Ceramic Trough 41 on wall in centre, with glazed interior. Supported on two brick piers. Small black metal cylinder 42 in foreground. Thick steel plate bolted down onto cylinder end, suggests high pressure. Water pressure stabiliser? Right, wooden cupboard.	N
273	E end wall of building, with various fixtures. Left (NE corner), wooden cupboard. Centre, Water(?) tap 46 and drain. White enamelled work top 47 on metal legs, with central drain or gas pipe? and two three-block supports for vessels. Used to process or heat samples? White enamel or ceramic splash back. Two triangular plates on splash back, purpose unknown. Right, side of large black metal cylinder 43.	E
275	<p>E end wall of building, with tall black metal cylinder 43 in SE corner. Cylinder 43 probably cast iron, about 2 m long, 0.5 m diameter. Top closed with thick steel plate, bolted down. Opening about 100 mm diameter cast in mid point of N side of cylinder, closed with steel or cast iron blanking plate, bolted on. Base of cylinder set in square sump or well in concrete floor. Various small pipes and inlet valve at base.</p> <p>Small (about 15 mm) pipe outlet on top of cylinder with three branches. Vent or sample point? Connections broken. May connect to small (about 20 mm) pipe on wall to right of cylinder. Medium (about 30 mm) diameter vertical pipe to R of cylinder, with two connections screwed into side of cylinder, about 0.5 m below top and 0.5 m above bottom of cylinder, each controlled by a shutoff valve with a large lever. Steel pipe with cast steel or iron connectors, screwed together. Pipe continues down into sump in floor.</p> <p>Horizontal pipe (about 20 mm) against S wall at floor level, with open junctions to vertical pipes (missing), and round shutoff valve with square shank.</p> <p>Inclined steel ladder bolted to cylinder 43.</p> <p>Apparatus 45 fixed to S wall, extreme Right of view, with broken vertical glass tube and open connections. Manometer? Water level gauge? Appears low pressure.</p>	ESE
279	<p>Left, detail of blue water treatment mixer 38, standing on four green-painted blocks. Riveted construction. Flanged opening on SW side. Method of attachment to mixer drum unclear. On concrete floor, various pipes with valves and flanges.</p> <p>Right, smaller black cylinder 42, ?cast iron, about 0.3 m diameter, about 0.5 m high. Top and bottom closed with thick steel or cast iron plates, bolted on to flanges. Small valve just above bottom flange, connected to rubber hose. Similar valve just below top flange. Two cast-iron brackets bolted to top plate, either side of central plug, perhaps removable. Vent plug? Fixing location for pressurising apparatus?</p> <p>To Right, wooden cupboard in NE corner made of white painted vertical wooden planks.</p>	NNE

Appendix 3 Discovery & Excavation in Scotland Entry

LOCAL AUTHORITY:	Perth and Kinross Council
PROJECT TITLE/SITE NAME:	Grundcruie Water Treatment Works, Methven
PROJECT CODE:	MV05
PARISH:	Methven
NAME OF CONTRIBUTOR:	David Bowler
NAME OF ORGANISATION:	Alder Archaeology Ltd
TYPE(S) OF PROJECT:	Historic Building Record
NMRS NO(S):	-
SITE/MONUMENT TYPE(S):	Industrial
SIGNIFICANT FINDS:	None
NGR (2 letters, 8 or 10 figures)	NO 0070 2658
START DATE (this season)	17 th March 2017
END DATE (this season)	17 th March 2017
PREVIOUS WORK (incl. DES ref.)	Bowler, D. P. 2018 Grundcruie Saw Mill, Methven, Archaeological Historic Building Record. Alder Archaeology Ltd, Perth.
MAIN DESCRIPTION: (May include information from other fields)	<p>Following the record of Grundcruie sawmill (Site Code MV04), near Methven, on 17th March 2017, Alder Archaeology expanded the record of the adjacent water treatment works (Site Code MV05). This was funded by the owner in advance of conversion to holiday accommodation.</p> <p>The water treatment works is a small rectangular building of mid-20th-century date, containing a variety of water treatment machinery, and appears to have provided the water supply for the nearby settlement of Methven. An enigmatic concrete structure in the woods to the W may also have been part of the system, or else perhaps a WWII defensive feature.</p>
PROPOSED FUTURE WORK:	None
CAPTION(S) FOR ILLUSTRS:	Grundcruie Water Treatment House, view N.
SPONSOR OR FUNDING BODY:	Mr Martin Cameron
ADDRESS OF MAIN CONTRIBUTOR:	Alder Archaeology Ltd, 55 South Methven Street, Perth PH1 5NX
EMAIL ADDRESS:	director@alderarchaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	HES (intended)

Illus 1 Grundcruie Water Treatment Works, Methven
Location

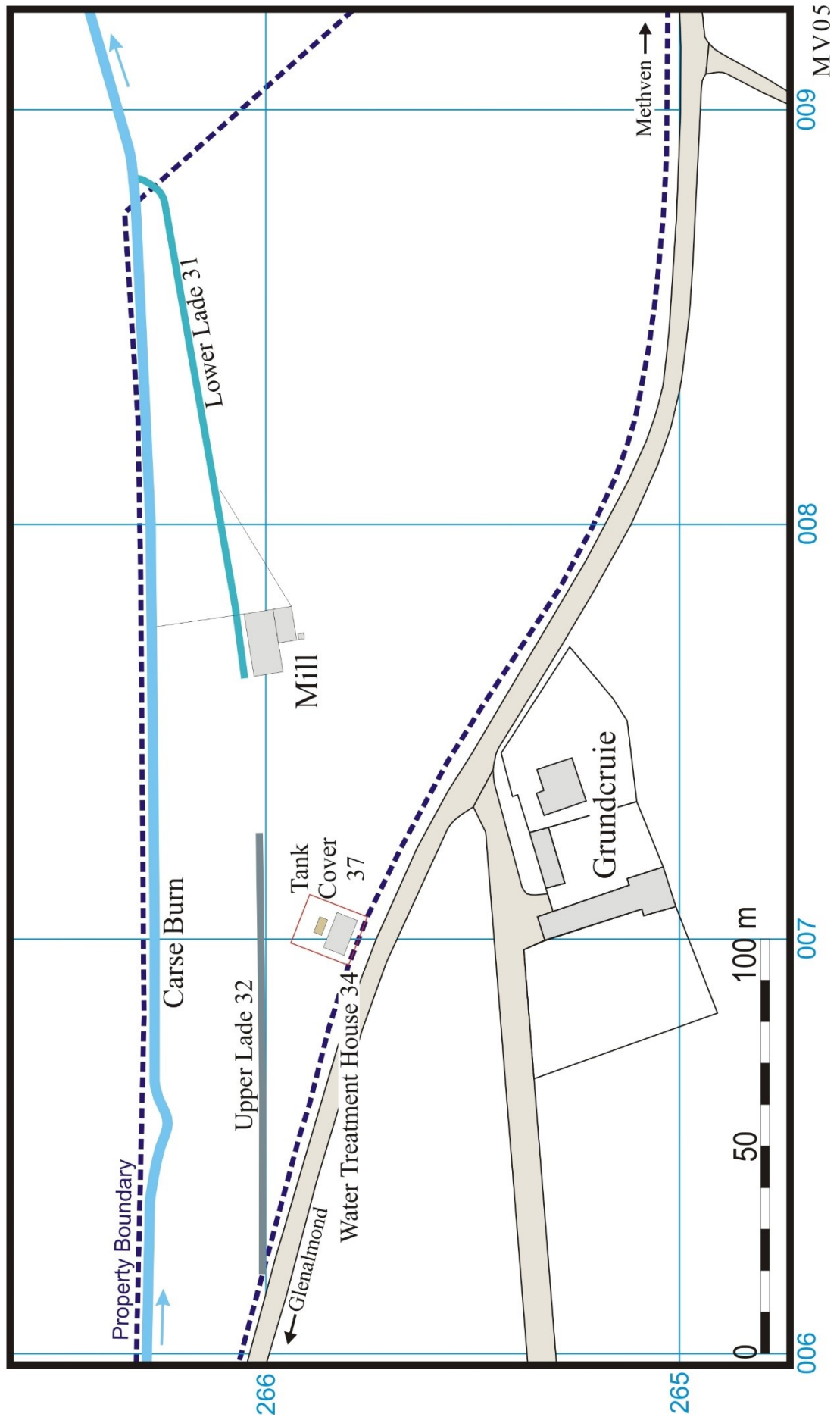


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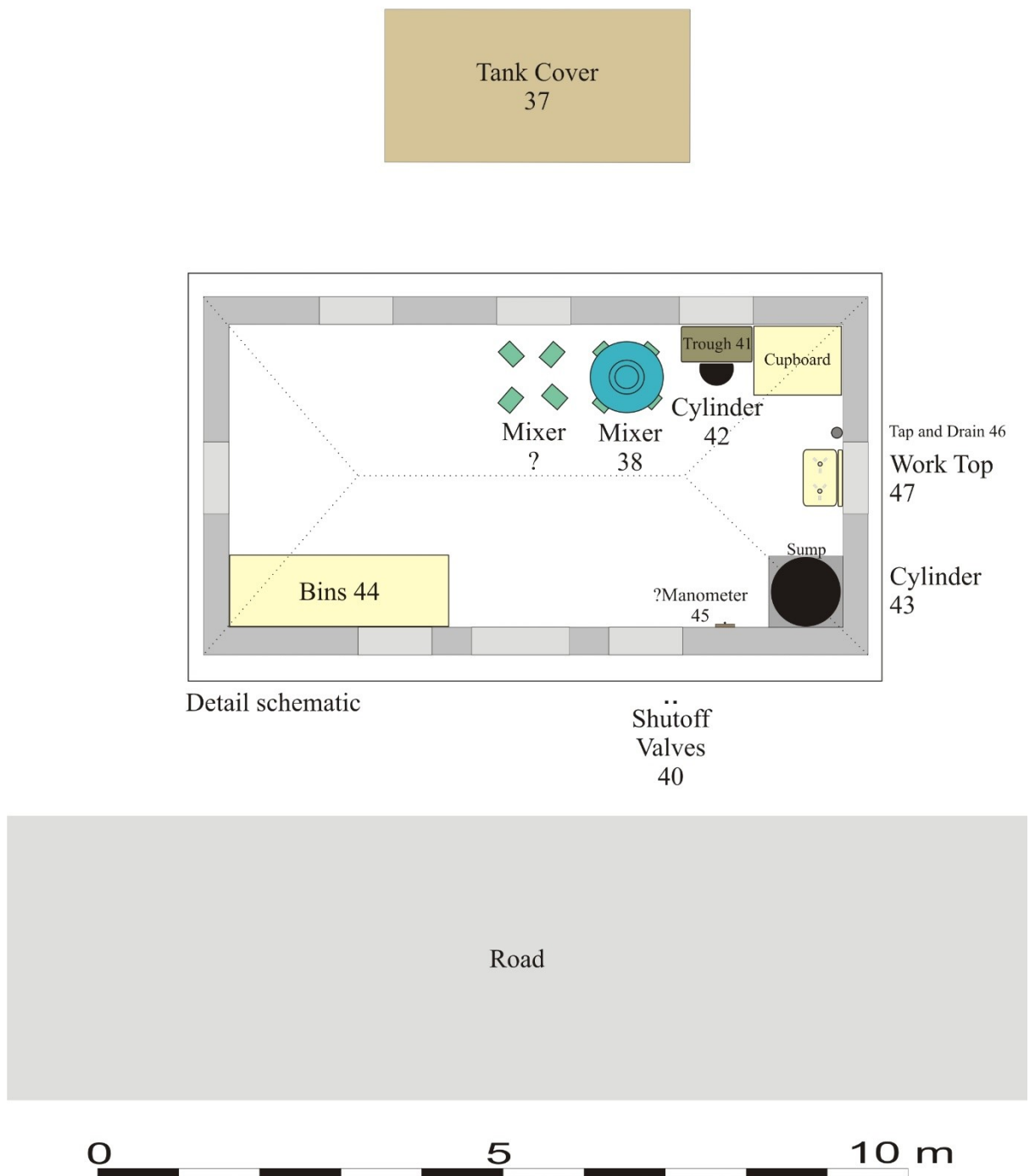
Grundcruie Water Treatment Works, Methven, Site Plan

Illus 2



Illus 3

Grundcruie Water Treatment Works, Methven Plan



MV05

Illus 4 - 5 Grundcruie Water Treatment Works, Methven



4 North elevation, with Tank Cover 37 in foreground



5 East elevation

MV05

Illus 6 - 7 Grundcruie Water Treatment Works, Methven



6 Interior, E, with Mixer 38 and other machinery



7 Detail, mixing arms inside Mixer 38

MV05