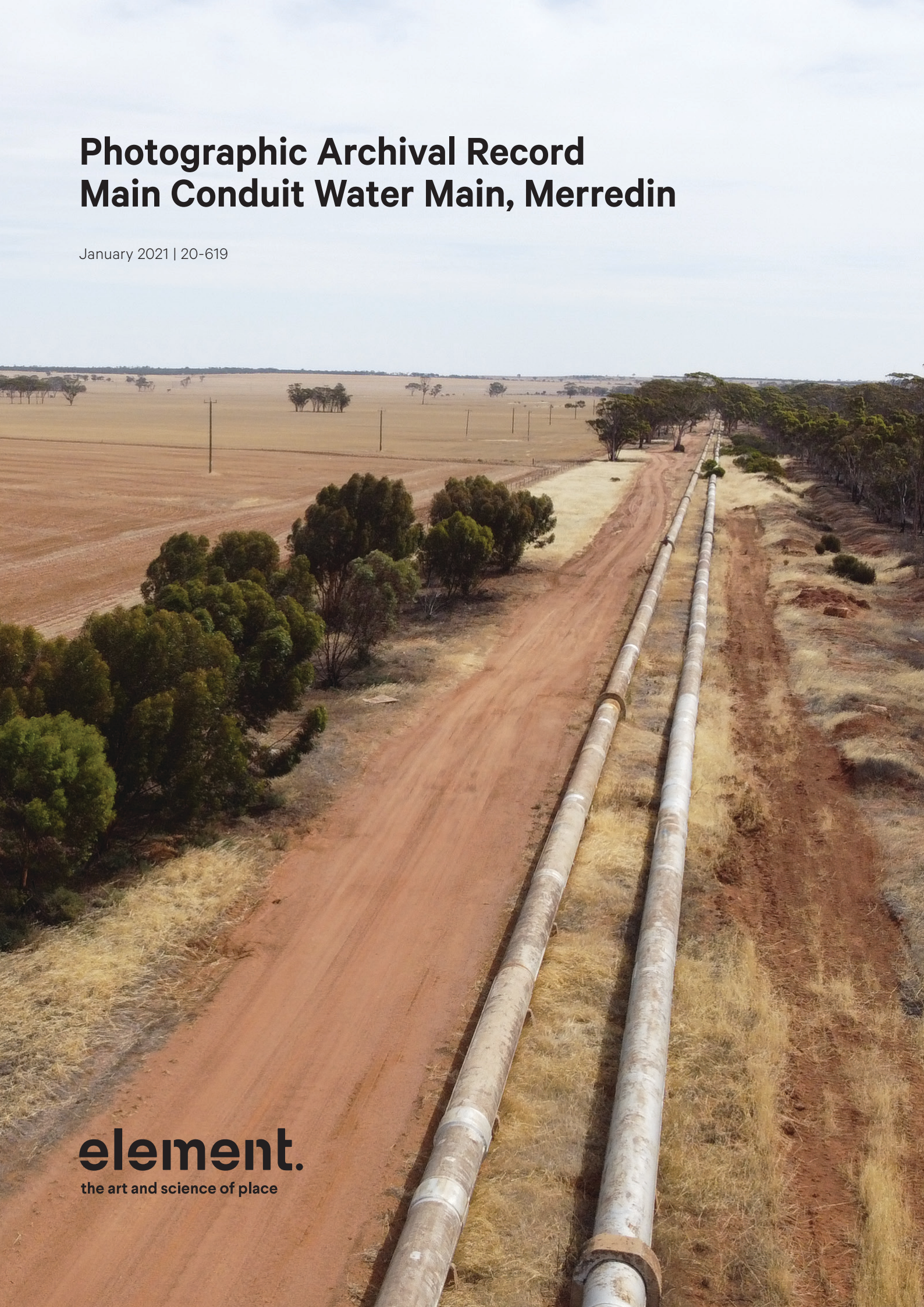
Photographic Archival Record
Main Conduit Water Main, Merredin

January 2021 | 20-619



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the art and science of place

We acknowledge the custodians of this land, the Nyakinyaki Nyoongar and their Elders past, present and emerging. We wish to acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region.

Document ID: /Volumes/Graphics/2020/20-619 Tammin Merredin Archival Records/Report/Final/20-619 Photographic Archival Record Main Conduit Water Main, Merredin Final Report Folder

Issue	Date	Status	Prepared by	Approved by
1	28.01.21	Draft	Carmel Given Alana Jennings	Flavia Kiperman
2	29.01.2021	Final	Carmel Given Alana Jennings	Flavia Kiperman

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1. Background

1.1 Purpose

The Water Corporation is proposing to upgrade sections of the main conduit water main (Mundaring – Kalgoorlie water pipeline) at Merredin. The upgrades will involve installation of a section of new underground pipe, and subject to the *Environmental Protection and Biodoversity Conservation Act 1999* (EPBC Act) approval, the removal of the existing aboveground pipe.

The Mundaring to Kalgoorlie Pipeline (Golden Pipeline) is part of the Goldfields Water Supply Scheme which is on the National Heritage List (Place ID 106007; Listed 2011). Under the EPBC Act, if a place on the National Heritage List and is being demolished or substantially altered, an archival record of the place must be produced. This Archival Record has been prepared for the Water Corporation by Element Advisory Pty Ltd (**element**) in January 2021. A site visit was undertaken on 14-15 January 2021 to photograph the study area.

1.2 Study Team

This report has been prepared by the following suitably qualified **element** staff members:

Name / Position	Qualifications
Flavia Kiperman, Principal Heritage	B.Sc. (Hons) (Architecture and Urban Planning), M.Sc (Heritage Management), M.Phil, M.ICOMOS
Carmel Given, Senior Consultant Heritage	GradDipInfoLibStds, BA (Cultural Heritage Studies), BA (English)
Alana Jennings, Consultant	BEnvDes (Environmental Design), M.Arch (Architecture), MHeri(Dist) (Heritage Studies), M.ICOMOS
Emily Greenwood, Assistant Planning	Bachelor of Humanities (Hons) Urban and Regional Planning

1.3 Methodology

Archival records fall within one of three categories – detailed, standard or photographic. The Water Corporation required a photographic Archival Record for the study area. This report complies with the minimum requirements as set out in the 'Guide to preparing an Archival Record' issued by Department of Planning, Lands and Heritage, 2019.

A site visit was undertaken on 14-15 January 2021. Detailed photographs were taken of the study area, including using drone photography. Photographs all date from 14-15 January 2021 and are reproduced in this report, accompanied by a Base Plan to indicate the position from which photographs were taken. All photographs were taken by **element**.

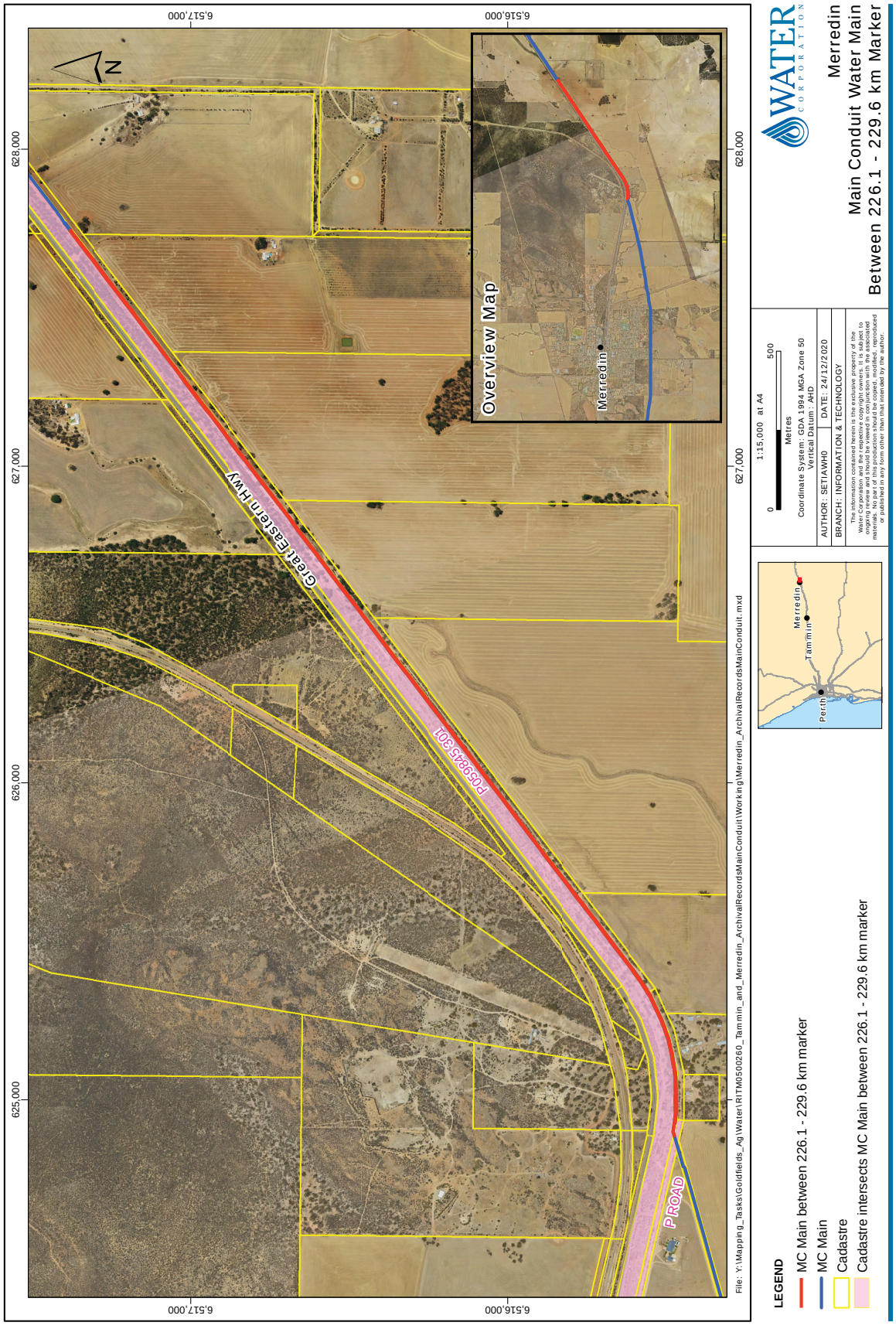
1.4 Location of the Study Area

The section of main conduit (MC) to be removed is between 226.1 km and 229.6 km markers, approximately 1km east of the town of Merredin, in the Shire of Merredin. The MC runs parallel to the Great Eastern Highway, on the south side of the roadway. The study area consists of two lots:

Description	Land ID	GPS
Road Hughes Road	3747420	Lat -31.487943 Long 118.309894
Crown Land Lot 301 of Plan 059845	3765158	Lat -31.477642 Long 118.334724

There is a Certificate of Title for Lot 301/P059845 (Refer to Section 5 of this report).
Refer to the Location Plan.

2. Location Plan



3. Base Plan

Note: For further information on plans, please contact Water Corporation.

NOTES:
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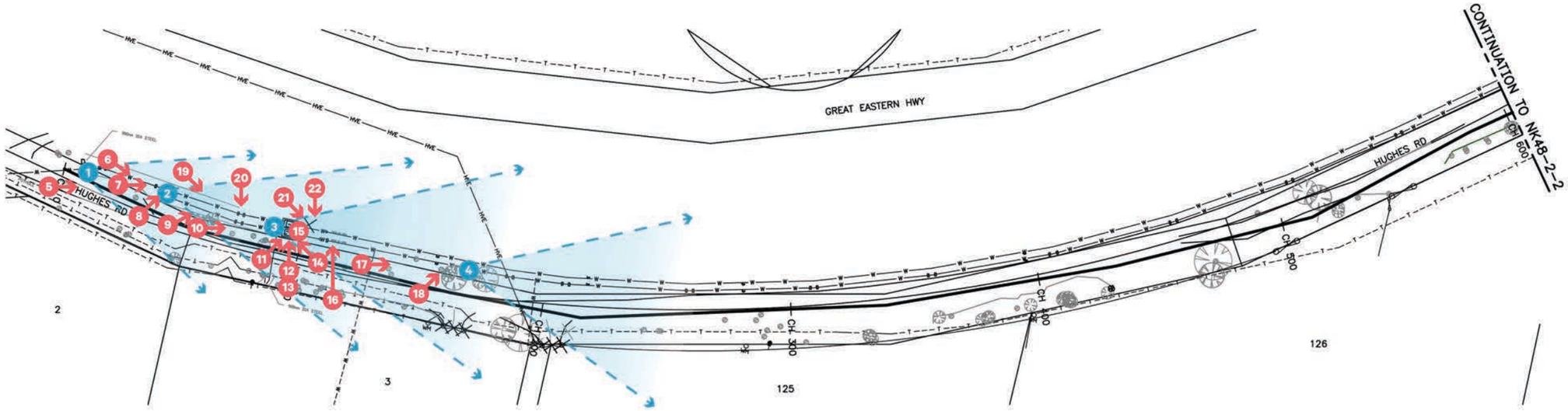
SURVEYED VEGETATION

EXISTING WATER MAIN

EXISTING BURIED TELSTRA SERVICE
EXISTING OVERHEAD POWER

PHOTOGRAPHS

DRONE IMAGES



PLAN
1:2000

Merredin

Main Conduit Water Main
226.1KM to 229.6KM Marker

DRAWING NUMBER: 001

ISSUED FOR RECORD

Project:	Archival Record - Merredin	Drawing No:	001
Drawing Title:	Main Conduit Water Main 226.1KM TO 229.6KM	Scale@A3:	1:2000
Date:	20/01/2020	Drawn:	AJ
Client:	Water Corporation	Checked:	FK
Job No:	20-619	Revision:	A

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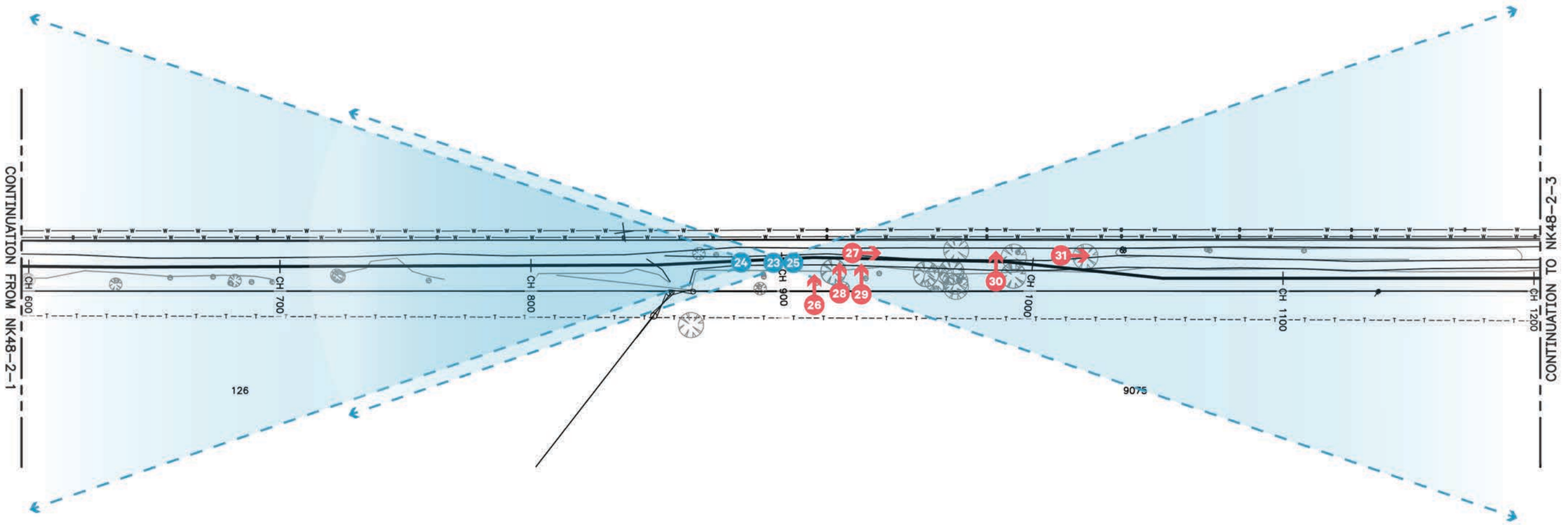
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PLAN
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Merredin

Main Conduit Water Main
226.1KM to 229.6KM Marker

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DRAWING NUMBER: 002

ISSUED FOR RECORD

Project:	Archival Record - Merredin	Drawing No:	002
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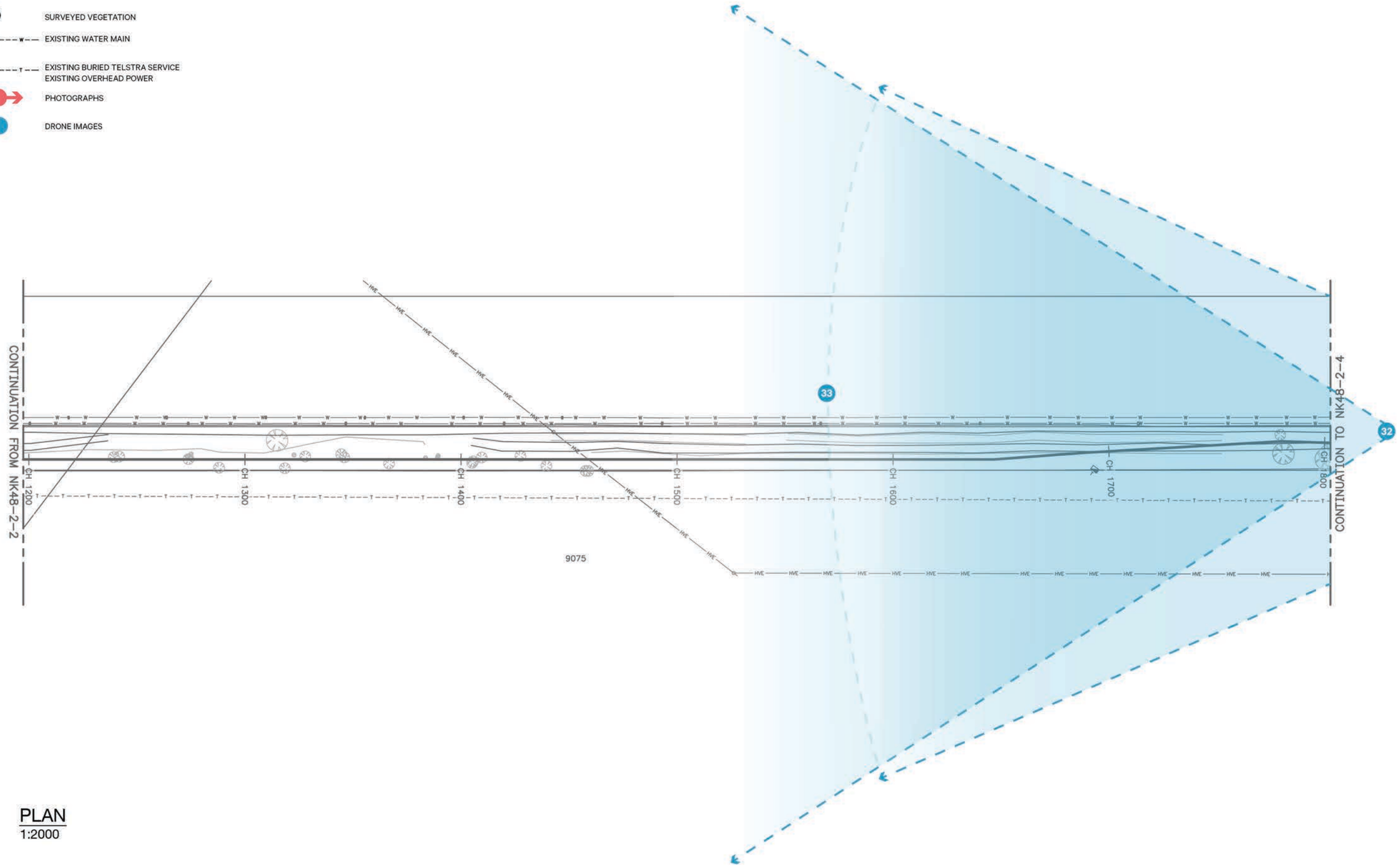
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PHOTOGRAPHS

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Merredin

Main Conduit Water Main
226.1KM to 229.6KM Marker

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Drawing Title:	Main Conduit Water Main 226.1KM TO 229.6KM	Scale@A3:	1:2000
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Client:	Water Corporation	Checked:	FK
Job No:	20-619	Revision:	A

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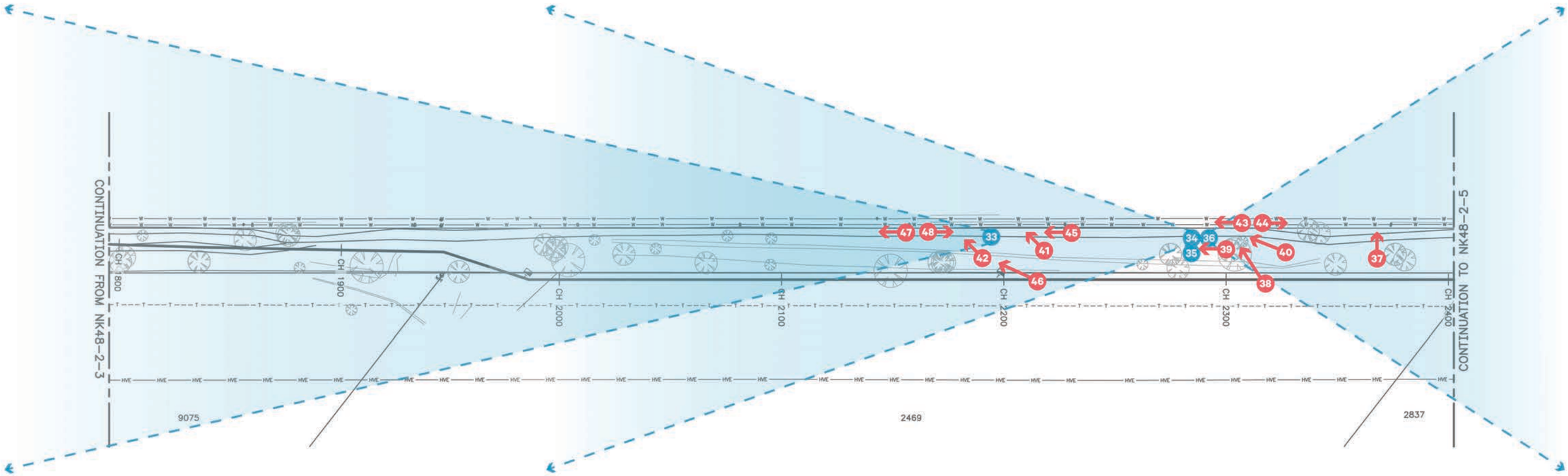
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Main Conduit Water Main
226.1KM to 229.6KM Marker

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Client:	Water Corporation	Checked:	FK
Job No:	20-619	Revision:	A

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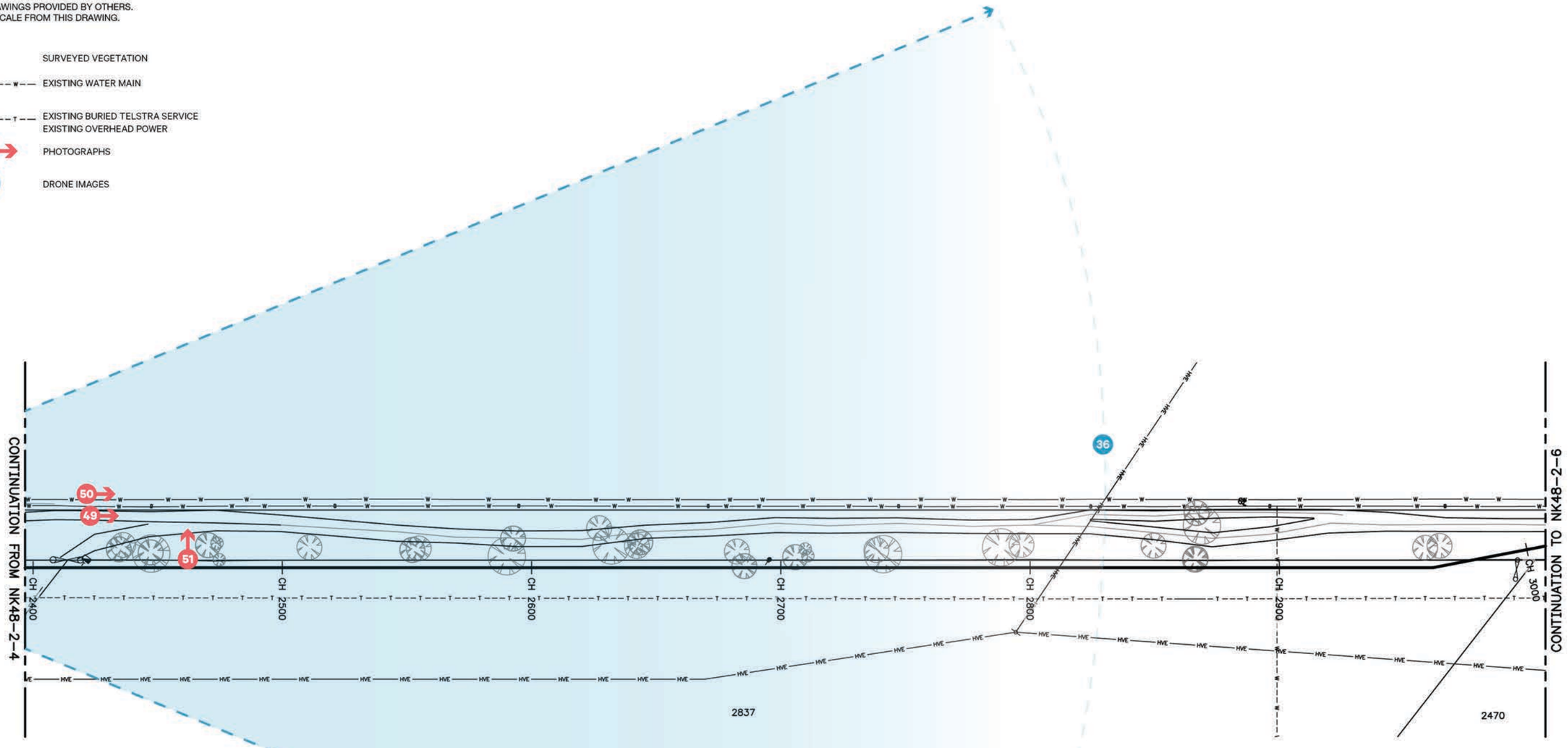
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EXISTING OVERHEAD POWER

PHOTOGRAPHS

DRONE IMAGES



PLAN
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Merredin

Main Conduit Water Main
226.1KM to 229.6KM Marker

DRAWING NUMBER: 005

ISSUED FOR RECORD

Project:	Archival Record - Merredin	Drawing No:	005
Drawing Title:	Main Conduit Water Main 226.1KM TO 229.6KM	Scale@A3:	1:2000
Date:	20/01/2020	Drawn:	AJ
Client:	Water Corporation	Checked:	FK
Job No:	20-619	Revision:	A

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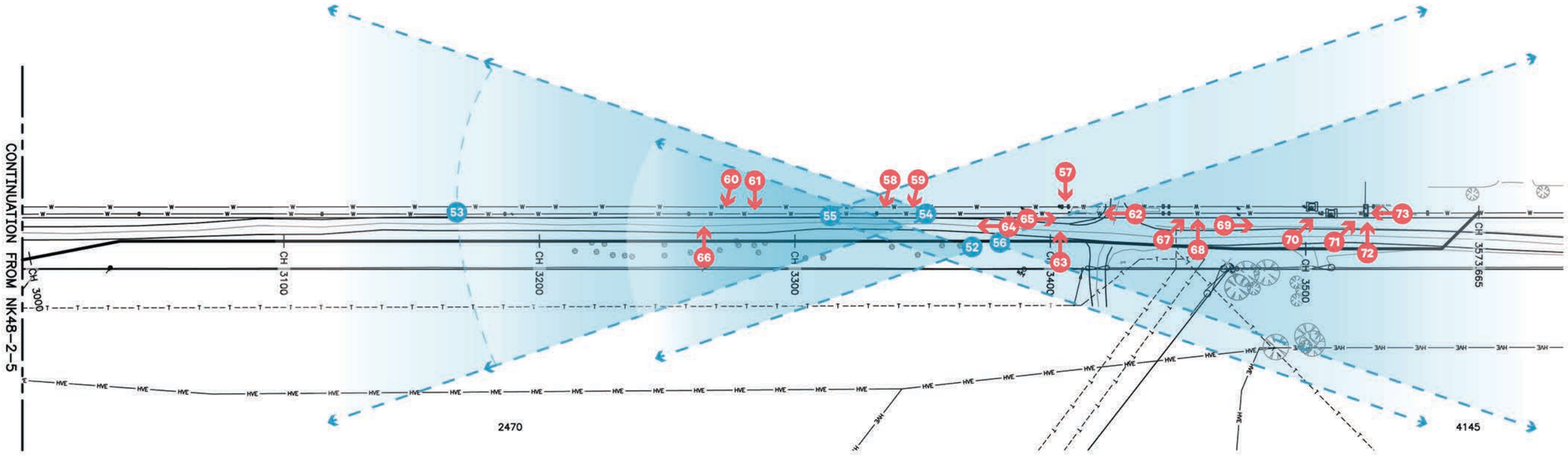
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PHOTOGRAPHS

DRONE IMAGES



PLAN
1:2000

Merredin

Main Conduit Water Main
226.1KM to 229.6KM Marker

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DRAWING NUMBER: 006

ISSUED FOR RECORD

Project:	Archival Record - Merredin	Drawing No:	006
Drawing Title:	Main Conduit Water Main 226.1KM TO 229.6KM	Scale@A3:	1:2000
Date:	20/01/2020	Drawn:	AJ
Client:	Water Corporation	Checked:	FK
Job No:	20-619	Revision:	A

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4. Brief Historical Overview

The MC Merredin (study area) is part of the larger 'Golden Pipeline.' An assessment for the Goldfields Water Supply Scheme, Western Australia, Mundaring to Kalgoorlie, WA, Australia was prepared for National Heritage Listing in 2011. Below is the Statement of Significance. The full document can be found at:

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=106007

4.1 Statement of Significance

The Goldfields Water Supply Scheme incorporates the remaining elements of the Coolgardie Goldfields Water Supply Scheme, as designed by engineer Charles Yelverton O'Connor (CY O'Connor) and completed in 1903. These elements include the former steam powered pump stations (and associated receiving tanks), reservoirs, regulating tanks and over 560km of pipeline, commonly referred to as the 'main conduit'. It is significant for the economic benefits it brought to Western Australia and to the nation as a whole, for its demonstration of outstanding technological achievement for its time, and for its association with the engineer, CY O'Connor.

The Goldfields Water Supply Scheme was the impetus for agricultural expansion that was of lasting benefit to Western Australia and to Australia as a whole. Water from the pipeline became available just as the production of gold on the eastern goldfields was starting to decline, but its true value resulted from the effect that regular water supplies had in opening up the south-western agricultural area to production. As the value of gold recovered on the goldfields declined between 1905 and the 1960s, the quantity and value of wheat produced increased steadily over the same period. Today the Western Australian wheatfields are the most productive in Australia, accounting for 42% of the nation's wheat crop. Most of the WA wheat crop is produced in the areas serviced by the goldfields pipeline and its extensions, which continues to operate as a water supply scheme.

Both in the size of the project and in the use of new technology the Goldfields Water Supply Scheme was an outstanding technological achievement in the early 20th century. CY O'Connor's original scheme, known as the Coolgardie Goldfields Water Supply Scheme and consisting of the pipeline itself, the reservoirs, and the pumping stations, was regarded internationally as being the largest such engineering undertaking for its time. The amount of steel used in construction was greater than for previous large steel structures elsewhere in the world. The contracts for the supply of steel were the largest pipe contracts, and the most expensive Australian construction contracts, let to that time.

The Goldfields Water Supply Scheme (including the individual components) is of outstanding value to the nation as a representative example of early 20th century engineering in Australia. Principal characteristics of the Goldfields Water Supply Scheme include: Mundaring Weir (Dam) including the dam wall, spillway and two valve houses; Mount Charlotte Reservoir, the former pump station buildings (and receiving tanks); regulating tanks and the pipeline itself. The scheme is recognised by the American Society of Civil Engineers as an International Historic Civil Engineering Landmark.

The pipeline also made use of innovative Australian design in the locking bar pipe invented by Mephan Ferguson.

The refurbishment of the pipeline in 1933 was also a major technical development. Lifting the pipeline out of the ground and re-laying it above ground placed the Goldfields Water Supply Scheme among the world leaders in pipeline technology for the second time in less than 40 years. During this process, the forces in the continuously welded pipeline resulting from expansion and contraction were directed into reinforced concrete anchor blocks built over the pipe to prevent movement and to transfer these forces into the ground. This was the first time anywhere in the world that pipe anchorages of this type had been used to permit such a large diameter pipeline to be laid above ground.

The Goldfields Water Supply Scheme is significant for its association with the work of CY O'Connor, Engineer-in Chief of the Western Australian Public Works Department from 1891 to his death in March 1902. O'Connor was the driving force behind the construction of the Scheme, which provided great economic benefit to Australia. At the completion of the work, the Premier Sir John Forrest praised him as "the great builder of this work … to bring happiness and comfort to the people of the goldfields for all time".

5. Certificate of Title

WESTERN AUSTRALIA

REGISTER NUMBER	
301/DP59845	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	**N/A**

VOLUME **LR3014** FOLIO **335**

RECORD OF QUALIFIED CERTIFICATE
OF
CROWN LAND TITLE
UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997
NO DUPLICATE CREATED

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 301 ON DEPOSITED PLAN 59845

STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)

STATUS ORDER/INTEREST: ROAD

PRIMARY INTEREST HOLDER: STATE OF WESTERN AUSTRALIA

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. L345473 DEDICATED ROAD REGISTERED 15/6/2010.

Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

----------END OF CERTIFICATE OF CROWN LAND TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	DP59845
PREVIOUS TITLE:	LR3014-335
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF MERREDIN
RESPONSIBLE AGENCY:	DEPARTMENT OF PLANNING, LANDS AND HERITAGE (ROAD)

NOTE 1: L345472 SUBJECT TO SURVEY - NOT FOR ALIENATION PURPOSES
NOTE 2: CORRESPONDENCE FILE 51106-2005-01RO

LANDGATE COPY OF ORIGINAL NOT TO SCALE 04/01/2021 01:22 PM Request number: 61453868
Landgate
www.landgate.wa.gov.au

6. Photographs



Figure 1. Aerial view along the pipeline looking east from the Merredin end of the study section in the vicinity of the 226km marker



Figure 2. Aerial view along the pipeline looking east from the Merredin end of the study section in the vicinity of the 226km marker



Figure 3. Aerial view along the pipeline looking east from the Merredin end of the study section in the vicinity of the 226km marker noting access point detail



Figure 4. Aerial view along the pipeline looking east from the Merredin end of the study section in the vicinity of the 226km marker



Figure 5. View of pipeline study section, Merredin end at emergence from underground portion in the vicinity of the 226km marker



Figure 6. View of pipeline study section, Merredin end at emergence from underground portion in the vicinity of the 226km marker



Figure 7. View of pipeline study section, Merredin end looking to the east in the vicinity of the 226km marker



Figure 8. View of pipeline study section, Merredin end looking east in the vicinity of the 226km marker



Figure 9. View of pipeline study section, Merredin end looking east towards connection point detail in the vicinity of the 226km marker



Figure 10. View of pipeline study section, Merredin end looking east in the vicinity of the 226km marker



Figure 11. View of pipeline study section, Merredin end looking east towards access point in the vicinity of the 226km marker



Figure 12. Access bunker from the southern side of pipeline looking north



Figure 13. Access bunker from the southern side of the pipeline looking north detail



Figure 14. Access bunker from the southern side of the pipeline looking west



Figure 15. Detail of access bunker as viewed from above



Figure 16. Connection detail



Figure 17. View of pipeline study section, Merredin end looking to the east in the vicinity of the 226km marker



Figure 18. View of pipeline study section, Merredin end looking to the east in the vicinity of the 226km marker



Figure 19. View of pipeline study section, Merredin end looking to the east in the vicinity of the 226km marker



Figure 20. Double concrete bracing detail



Figure 21. Access bunker from the northern side of the pipeline looking east



Figure 22. Access bunker from the northern side of the pipeline detail



Figure 23. Aerial view of the pipeline adjacent to 227km marker looking west



Figure 24. Aerial view of pipeline adjacent to 227km marker looking west



Figure 25. Aerial view of pipeline adjacent to 227km marker looking east



Figure 26. 227km marker detail



Figure 27. Pipeline study section adjacent to 227km marker from the southern side looking east



Figure 28. Concrete bracing detail



Figure 29. Welding detail



Figure 30. Pipeline study section in the vicinity of the 227km marker in context as viewed from the southern side



Figure 31. Pipeline study section in the vicinity of the 227km marker from the southern side looking east



Figure 32. Pipeline in context between the 227km and 228km markers looking west



Figure 33. Pipeline in context in the vicinity of the 228km marker looking west



Figure 34. Pipeline in context in the vicinity of the 228km marker looking west



Figure 35. Pipeline in context in the vicinity of the 228km marker looking west



Figure 36. Pipeline in context in the vicinity of the 228km marker looking east



Figure 37. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side



Figure 38. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking west



Figure 39. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side in detail



Figure 40. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking west



Figure 41. Pipeline study section in the vicinity of the 228km marker concrete bracing element as viewed from the southern side



Figure 42. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side



Figure 43. Pipeline study section in the vicinity of the 228km marker as viewed from between the two pipelines looking west



Figure 44. Pipeline study section in the vicinity of the 228km marker as viewed from between the two pipelines looking east



Figure 45. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking west



Figure 46. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking west



Figure 47. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking west



Figure 48. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking east



Figure 49. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking east



Figure 50. Pipeline study section in the vicinity of the 228km marker as viewed from the southern side looking east



Figure 51. Pipeline materiality texture and patina detail



Figure 52. Elevated view of the pipeline in the vicinity of the 229km marker looking west



Figure 53. Aerial view of the pipeline in the vicinity of the 229km marker looking west



Figure 54. Aerial view of the pipeline in the vicinity of the 229km marker looking west



Figure 55. Aerial view of the pipeline in the vicinity of the 229km marker looking east



Figure 56. Aerial view of the pipeline in the vicinity of the 229km marker looking east



Figure 57. Pipeline study section in the vicinity of the 229km marker connection and bracing detail



Figure 58. Pipeline study section in the vicinity of the 229km marker looking west



Figure 59. Pipeline study section in the vicinity of the 229km marker detail



Figure 60. Pipeline study section in the vicinity of the 229km marker looking west



Figure 61. Pipeline study section in the vicinity of the 229km marker materiality detail



Figure 62. Pipeline study section emerging from covered section below access road looking west



Figure 63. Pipeline study section emerging from covered section below access road in detail noting typical concrete bracing elements



Figure 64. Pipeline study section in the vicinity of the 229km marker viewed from the southern side looking west



Figure 65. Pipeline study section in the vicinity of the 229km marker viewed from the southern side looking east



Figure 66. Pipeline study section in the vicinity of the 229km marker materiality detail



Figure 67. Pipeline study section emerging from covered section below access road looking east



Figure 68. Pipeline materiality texture and patina detail



Figure 69. Pipeline study section in the vicinity of the 229km marker looking east



Figure 70. Pipeline study section 229.6km connection detail



Figure 71. 229.6km access point detail viewed from the southern side looking east



Figure 72. 229.6km access point detail viewed from the southern side



Figure 73. 229.6km access point detail viewed from the southern side

7. Bibliography

National Heritage List, P106007 Goldfields Water Supply Scheme. 23 June 2011.

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=106007

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the art and science of place

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