Presentation at Investigating Infrastructure conference, Sheffield Hallam University, 13 June 2018

Lost infrastructures and historic visual representations: case study of power generation in east Manchester in the post-war period

Martin Dodge, Department of Geography, University of Manchester

Drawing on ideas from historical geography, visual culture and cartographic communication this talk considers how far large infrastructure sites can be recovered through historic visual representations that have survived and are publicly available in archives. Looking in particular at the massive fossil-fuelled energy production sites which had a dominating physical presence in many British cities from the late nineteenth century and through first half of twentieth century, this talk focuses on a distinctive cluster of gas works, power station and colliery that were situated in the Bradford area of east Manchester. Nearly all trace of these major infrastructures is lost from the urban landscape by the late twentieth century and it is interesting to consider how far their distinctive form, architectures, production methods and material presence can be envisioned and narrated using original building plans, engineering drawings, OS mapping, process diagrams, aerial photography and other technical inscriptions.

Martin Dodge is Senior Lecturer in the Geography Department at the University of Manchester. His intellectual interests focus on digital technologies, urban historical geography, and the politics of maps and visualisation. He has also co-edited a series of books on the development of cartographic ideas: *Geographic Visualization* (2008), *Rethinking Maps* (2009), *Classics in Cartography* (2010), *The Map Reader* (2011), *Mapping - Critical Concepts in Geography* (2015) and *Mapping Across Academia* (2017). Much of his current empirical research is on the history of Manchester and he has co-curated several high-profile public exhibitions on aspects of the city, including *Mapping Manchester* (2009), *Infra_MANC* (2012) and *Making Post-war Manchester* (2016). His latest co-written book, *Manchester: Mapping the City* will be published by Birlinn in autumn 2018.

Investigating Infrastructure

SHU Space & Place Group - interdisciplinary conference

9.30am-5.00pm, Wednesday 13 June 2018

Room 210, Norfolk Building, City Campus, Sheffield Hallam University

Free event (places are limited: please register via Eventbrite)

Sheffield Hallam University

FEATURING: Infrastructure's objects – infrastructures of autonomy – searching out the traces of historic infrastructure – the politics of power distribution – ballroom as infrastructure – front yards as interface infrastructure – green infrastructure and mental health – using infrastructural mapping techniques to investigate culture – sonospheric investigation of media infrastructures – the poetics of windfarms – infrastructural haiku – assessing infrastructure for the zombie apocalypse

lukebennett13

Tracing the spectacular within the humdrum of the built environment

Investigating Infrastructure – The 2018 SHU SPG conference, 13 June 2018

MAY 8, 2018 LEAVE A COMMENT (HTTPS://LUKEBENNETT13.WORDPRESS.COM/2018/05/08/INVESTIGATING-INFRASTRUCTURE-THE-2018-SHU-SPG-CONFERENCE-13-JUNE-2018/#RESPOND)

This year the SHU Space & Place Group's interdisciplinary conference is themed around *"Infrastructure"*. Drawing across an array of disciplinary traditions and perspectives in a mix of presentations and activities our presenters will invite participants to explore the ways in which (tangibly and intangibly) infrastructure permeates space and enables place. Our event will take an expansive definition of infrastructure, ranging from big, heavy, monumental industrial objects to the faint structures that quietly enable and shape the world around us, and our daily experiences within it. During the day, in an optimum and productive mix of playful and serious, you will encounter infrastructure in the shape of singing turbines, hot pipes, chatty buildings, dancing places, recuperative greenspaces and as refuges from the zombie apocalypse.

The event is free to attend, and you will even get refreshments and a packed lunch (courtesy of sponsorship by SHU's Department of the Natural & Built Environment).

SHU SPG events are open to all, and whether SHU staff or beyond our institution. A physical limit is set for by the capacity of the venue, thus registration will be on a 'first come first served' basis.

Tickets can be booked here: https://www.eventbrite.com/e/investigating-infrastructure-the-2018-shu-spg-conference-tickets-45721336749 (https://www.eventbrite.com/e/investigating-infrastructure-the-2018-shu-spg-conference-tickets-45721336749)

PROGRAMME

9.30-9.45 WELCOME & INTRODUCTION

Luke Bennett, Natural & Built Environment Dept, SHU

This introduction will summarise key themes arising from the SHU SPG panel event *Beneath the City Streets: four researchers explore urban infrastructure and its invisibility* held on 21 March 2018 and suggest how these themes might productively inform this conference's ruminations.

9.45- 11.15 SESSION 1: INFRASTRUCTURE, POWER AND PLACE

Chair, Luke Bennett, Natural & Built Environment Dept, SHU

9.45 – 10.00 Infrastructure's objects

Richard Brook – Manchester School of Architecture

Infrastructure, whilst often characterised in terms of its invisibility via network multiplicity, functional ubiquity and semantic indeterminacy, still depends upon local, fixed, physical points of presence. This presentation will consider the objectification of infrastructure from an architectural perspective by showing how the seemingly invisible and diffuse is necessarily materialised and localised in the form of the built artefacts of infrastructure which are, by turns, prosaic and monumental. Infrastructure will be described as object and as producer of objects and the materiality and materialisation of infrastructure as concretised yet simultaneously ethereal. Such a situation seeks to explore the limits of the urban, the expanded geography and the morphology of the contemporary city.

10.00 – 10.15 Infrastructures of autonomy

Sam Vardy & Cristina Cerulli – Natural & Built Environment Dept, SHU (Architecture)

We will present critical readings of infrastructures as fertile grounds for the development of autonomous initiatives. Drawing on insights from design research developed within the context of a Masters' architecture design studio, we will explore what we might understand as infrastructure, looking beyond common instances (pipes, roads and communications systems etc.) to reveal other possible of alternate infrastructure(s) manifestations, implications and affects – spatially, socially and politically.

10.15 – 10.30 Transforming urban heat infrastructure: place, territory and politics.

William Eadson, Centre for Economic & Social Research, SHU

Urban heat infrastructure in the UK is undergoing transformation as cities seek to move towards, cheap and secure low carbon energy sources. But such transformations are contingent on a wide range of entanglements between actors and materials that are often spatially distanciated and precariously held in place through a range of different means. In this presentation I will use case studies from English cities (including Sheffield) to focus on the territorial politics of urban heat: how territory is constructed and put to use in the development of new urban heat infrastructure.

10.30 – 10.45 Lost infrastructures and historic visual representations: case study of power generation in east Manchester in the post-war period

Martin Dodge – University of Manchester (Geography)

Drawing on ideas from historical geography, visual culture and cartographic communication this talk considers how far large infrastructure sites can be recovered through historic visual representations that have survived and are publicly available in archives. Looking in particular at the massive fossil-fuelled energy production sites which had a dominating physical presence in many British cities from the late nineteenth century and through first half of twentieth century, this talk focuses on a distinctive cluster of gas works, power station and colliery that were situated in the Bradford area of east Manchester. Nearly all trace of these major infrastructures is lost from the urban landscape by the late twentieth century and it is interesting to consider how far their distinctive form, architectures, production methods and material presence can be envisioned and narrated using original building plans, engineering drawings, OS mapping, process diagrams, aerial photography and other technical inscriptions.

10.45 – 11.15 Panel Discussion

11.15-11.45 BREAK

11.45 – 1.00 SESSION 2: INFRASTRUCTURE, INTERFACES & INTERACTION

Chair: Carolyn Gibbeson, Natural & Built Environment Dept, SHU

11.45-12.00 High society or squatters? Competition dancing, affordances and engaging with the infrastructure of the ballroom

Fides Matzdorf – Sheffield Business School, SHU (Facilities Management)

Dance is all about space – moving through space, sharing space, claiming, 'hogging' and defending space and thereby framing and operating a highly structured social interface. Just as matter moves through hard infrastructure (pipes, wires, channels), so bodies flow through the ballroom. I'll take you on a short journey of pictures and stories through the spatial trials and tribulations associated with a competition day – complete with paradoxes, contradictions and ironies in order to explore this and the underlying infrastructural orderings of the ballroom as a competitive space. This journey will reflect on the awkwardness of the notion of 'backstage' as a place in which the necessary messiness of an event is hidden – and will by analogy further question the supposed 'invisibility' of any infrastructure and of its operations.

12.00 – 12.15 The interaction zone: interpreting English and Dutch urban domestic interfaces as an infrastructure for sociality

Kaeren Van Vliet – Natural & Built Environment Dept, SHU (Architecture)

Public private interfaces form a continual infrastructure running through the built environment (Wohl 2017) where messages are recorded and relayed. The interface can also be understood as a place (Dovey & Wood 2015) where public and private are negotiated and values are displayed. This presentation uses the tensions and synergies between emerging theoretical understanding of the interface to undertake a micro-spatial and visual exploration of English and Dutch domestic interfaces

12.15 – 12.30 Green Infrastructure for mental health

Jo Birch – University of Sheffield (Landscape Architecture)

This paper foregrounds 'the value' and 'values' of a city's green infrastructure and urban nature in responding to societal challenges around human wellbeing and mental health. Whilst nature-based therapeutic activities are acknowledged as potentially useful in mental health recovery (Bragg and Leck 2017) and/or 'social citizenship' (Parr 2007), we know too little about how green infrastructure may play a role in coping with mental illness, recovery or prevention. Through discussion of findings from the Improving Wellbeing through Urban Nature (IWUN) project I share values of urban nature told by a group of people with mental health difficulties living in Sheffield, discussing what this means for both urban planning and healthcare.

12.30 – 1.00 Panel Discussion

1.00 – 1.45 LUNCH

1.45 – 2.45 SESSION 3: INVESTIGATING THE SPACES & PLACES OF INFRASTRUCTURE

Chair: Becky Shaw, Sheffield Institute of Arts, SHU

1.45 – 2.00 Towards the development of innovative interfaces for spatial mapping of cultural infrastructure

Rebecca Sharp – Natural & Built Environment Dept, SHU (Geography)

The proposed work will aim to develop a prototype of an innovative interface to map cultural infrastructure. The research will draw on the theoretical and data analysis techniques from engineering and infrastructure studies and apply these techniques to non-infrastructure research. The work will apply innovative spatial visualisation techniques together with social media textual analysis to provide an overview of different spatial social cultural interactions. Social media data analysis has been a growing area of research over the last decade with geotagging analysis becoming increasingly popular in the last few years. Gaps in knowledge still exist in effectively visualising this data and the outreach of this information to communities and policy makers. This research will thus build on the previous literature to review different ways to visualise data in an interactive (spatial and temporally) multi-layer interface.

2.00 – 2.15 Sonospheric Investigations

Matt Parker – University of the Arts London (Sound Artist)

This presentation will introduce the sonospheric investigation as a research methodology for attending to the obfuscated energies and vibrations of media infrastructures. It will introduce some of the practical and ethical challenges encountered when negotiating access to critical nodes of the Internet 's material plane, from the position of an artist and spatial practitioner. Lastly, I will discuss some of the weirder things you might find the other side of the high security perimeter fence.

2.15 – 2.30 White Thorns: the poetics of windfarms

Brian Lewis, Longbarrow Press (Poet)

The story of the Isle of Axholme, an area of reclaimed marshland in North Lincolnshire, is one of engineering and extraction. Even before it was drained, realigned and flattened in the 1620s, the land was regarded as a source of fuel; by the 1980s, small-scale peat cutting had given way to intensive harvesting, a period in which gas and coal exploration also fissured the isle. The colliery at Thorne is now a solar park, and the flatlands are crowned by the wheel and flicker of wind turbines, including a 34-turbine array at Keadby; the largest onshore wind farm in England. Drawing on a sequence of poems based on recent walks around the isle, this presentation will reflect on how Axholme's resource infrastructure has moved above ground in the 21st century and consider how the scale and dynamism of the 'white thorns' impacts on the affective experience of landscape.

2.30 – 3.00 Panel Discussion & briefing for the two activities

3.00 – 5.00 SESSION 4: TWO ACTIVITIES NARRATING INFRASTRUCTURE

3.00 – 4.00 Activity 1

GROUP A: An indoor walking survey with *John Grant (Natural & Built Environment Dept, SHU)* to assess a university building's infrastructural resilience and preparedness for surviving a zombie apocalypse (guided walk from Norfolk 210 to Cantor Building Room 9140).

GROUP B: A short outdoor walk to inspire an infrastructural haiku writing workshop led by landscape poet *Brian Lewis of Longbarrow Press* (assemble in Cantor Building Room 9140).

4.00 – 5.00 Activity 2

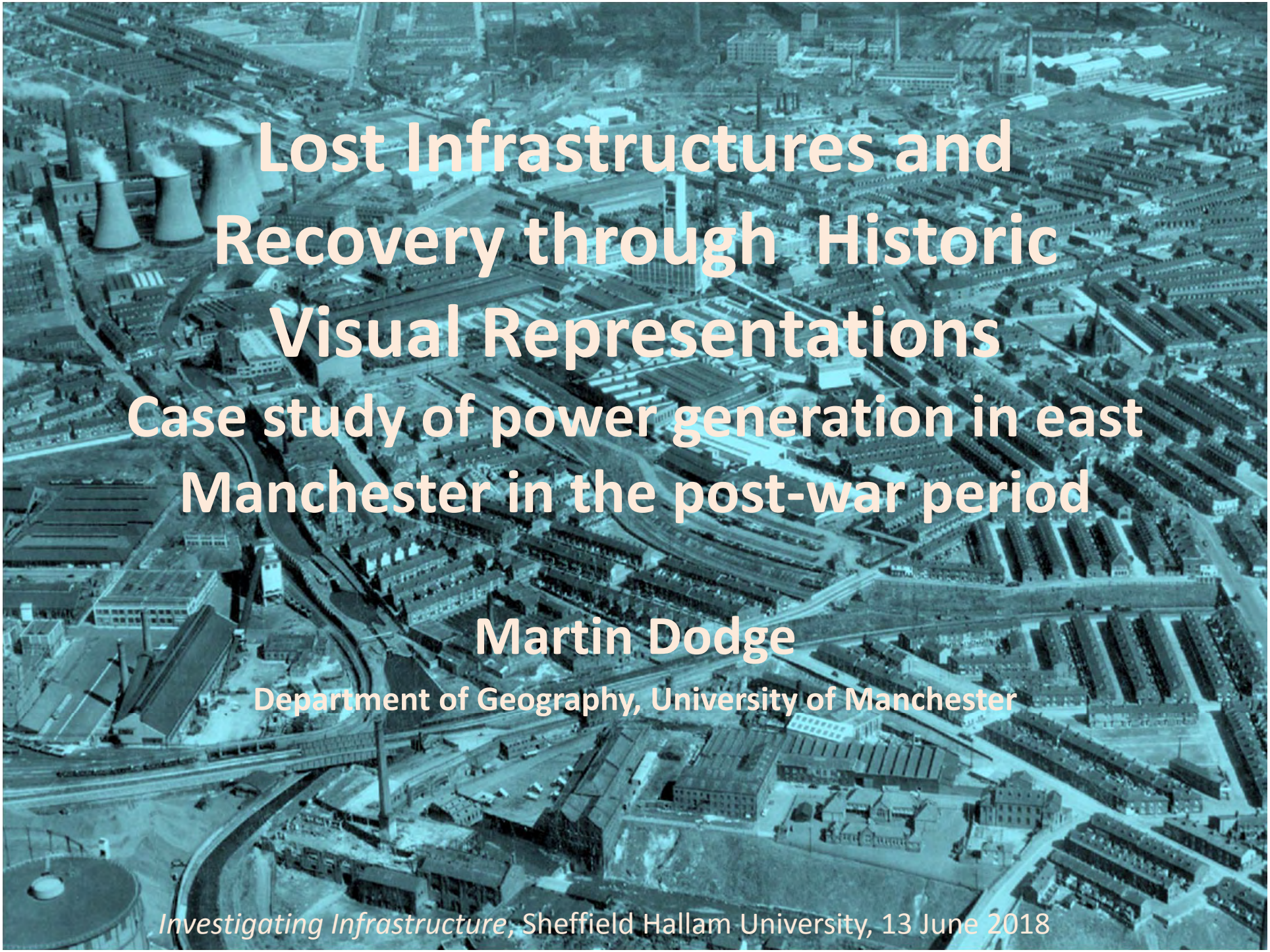
GROUP A: A short outdoor walk to inspire an infrastructural haiku writing workshop led by landscape poet *Brian Lewis of Longbarrow Press* (guided walk from Norfolk 210 to Cantor Building Room 9138).

GROUP B: An indoor walking survey with *John Grant (Natural & Built Environment Dept, SHU)* to assess a university building's infrastructural resilience and preparedness for surviving a zombie apocalypse (assemble in Cantor Building Room 9138).

5.00 END OF THE EVENT

Image credit: Matt Parker

FILED UNDER ANT, OOO AND THINGOLOGY, BUILT ENVIRONMENTS, INFRASTRUCTURE, MEANING MAKING, TELECOMMUNICATIONS



Lost Infrastructures and Recovery through Historic Visual Representations

Case study of power generation in east Manchester in the post-war period

Martin Dodge

Department of Geography, University of Manchester

Investigating Infrastructure, Sheffield Hallam University, 13 June 2018

Intellectual framing for ‘Investigating Infrastructures’

- Historical geography
  - Why of where, <u>and</u> where+when
  - Chorographic approach (spirit of the place, richer envision); ‘deep mapping’ (more instrumental and visual than personal and literary)
- Visual culture
  - Technical images have politics
  - Every view has a perspective. Things are shown to us and many other aspects remain hidden
  - Institutional contexts of production
  - The nature of distribution, access, audience. Context of re-viewing images (such as academic workshops!)

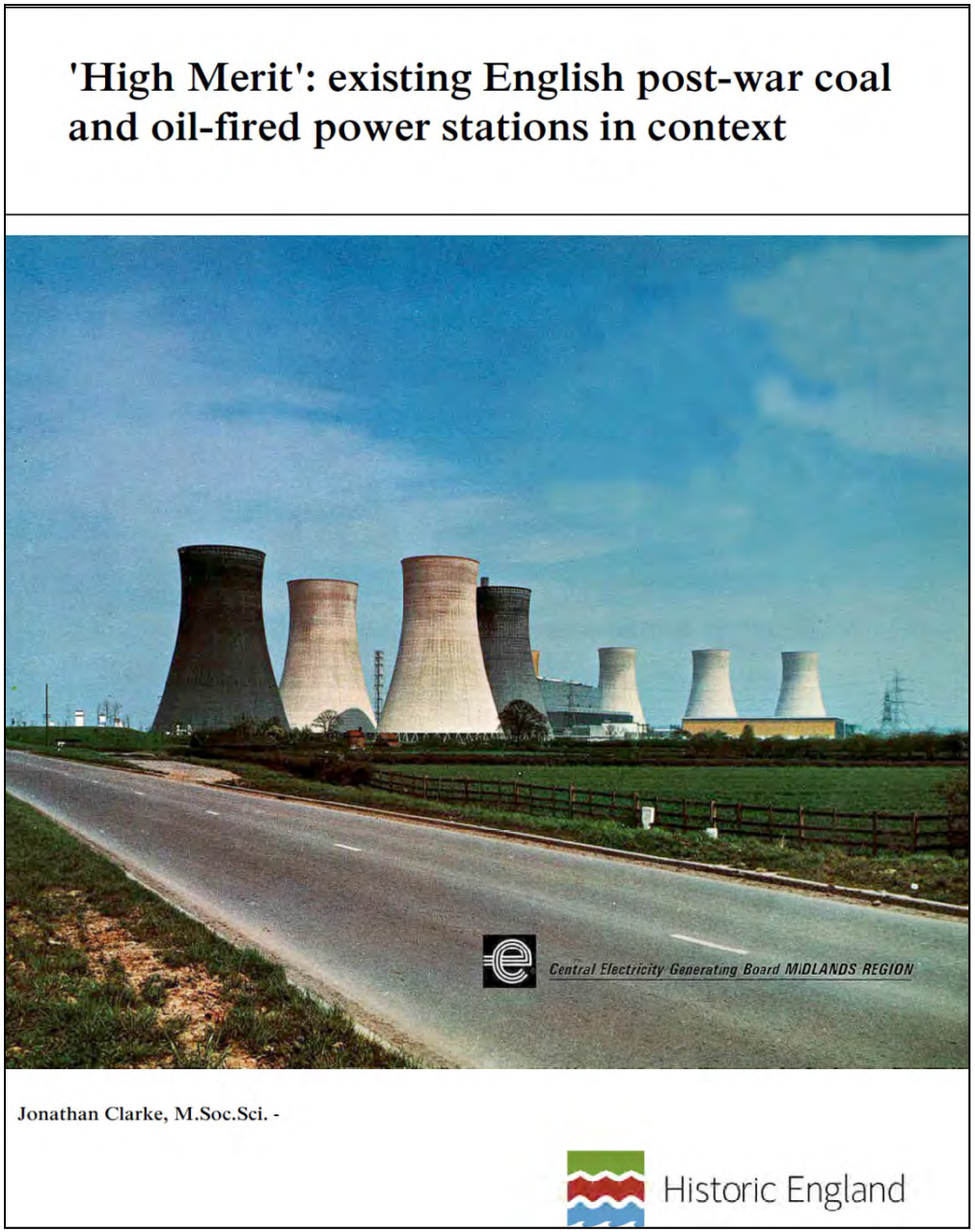
Lost Infrastructures

- "… we now recognise that much 18th and 19th century infrastructure is itself valued heritage. Some of it represents the birth of a new world order, reflecting Britain's emergence as the first industrial nation" (Sir Neil Cossons, chair of EH, 2010, p5)
- Some infrastructures become nice heritage, iconic bridges and viaducts, canals and their tow paths
- formerly ugly and dirty infrastructure have become important, significant nostalgia of Victorian steam age
- Continuing growth in industrial heritage
- But c20th, big, ugly, polluting, concrete and impersonal infrastructures that touch lives but sites production were not experienced are harder to love..

http://industrialheritage.eu/EYCH2018/May/In-memoriam-for-a-chimney

“Power stations with cooling towers are a highly threatened and increasingly rare building type. … no natural draft hyperbolic concrete towers survive from the pre-war, or pre-Nationalisation era” (2015, p.7)

- Almost nothing left of power of coal in British landscape. Few chimneys, pithead winding gear all demolished
- Town gas works all gone. Gasometers are unused and being demolished
- Can imagine when the only cooling tower will be seen in photographs?



What will happen to East Manchester's iconic gas holders?

The industrial landmarks near to the Etihad stadium are set to be de-commissioned as the area is dramatically regenerated

By Jennifer Williams
13:34, 8 DEC 2017 UPDATED 13:48, 8 DEC 2017

East Manchester's gas holders are not only a legacy of the area's heavy industrial past, but increasingly are also something of a rarity.

www.salfordstar.com/article.asp?id=4556 80%

SALFORD COMMUNITY SONGS AND JAM TO SAVE DIRTY OLD TOWN GASWORKS

Star date: 10th June 2018

COMMUNITY SONGS AND JAM SESSION TO STOP DEMOLITION OF SALFORD GASWORKS

Community Songs and Instrument Jam
Sunday 17th June 2pm
Salford Gasworks, Liverpool Street

As work begins to demolish Salford gasworks, made famous in Ewan MacColl's Dirty Old Town, the community is mobilising to try and get the National Grid to revamp them, rather than trash yet more of the city's heritage. Petitions have been launched and next Sunday there is to be a community singsong and jam session at the site.

Full details here...

Bradford Colliery
C18th – 1968

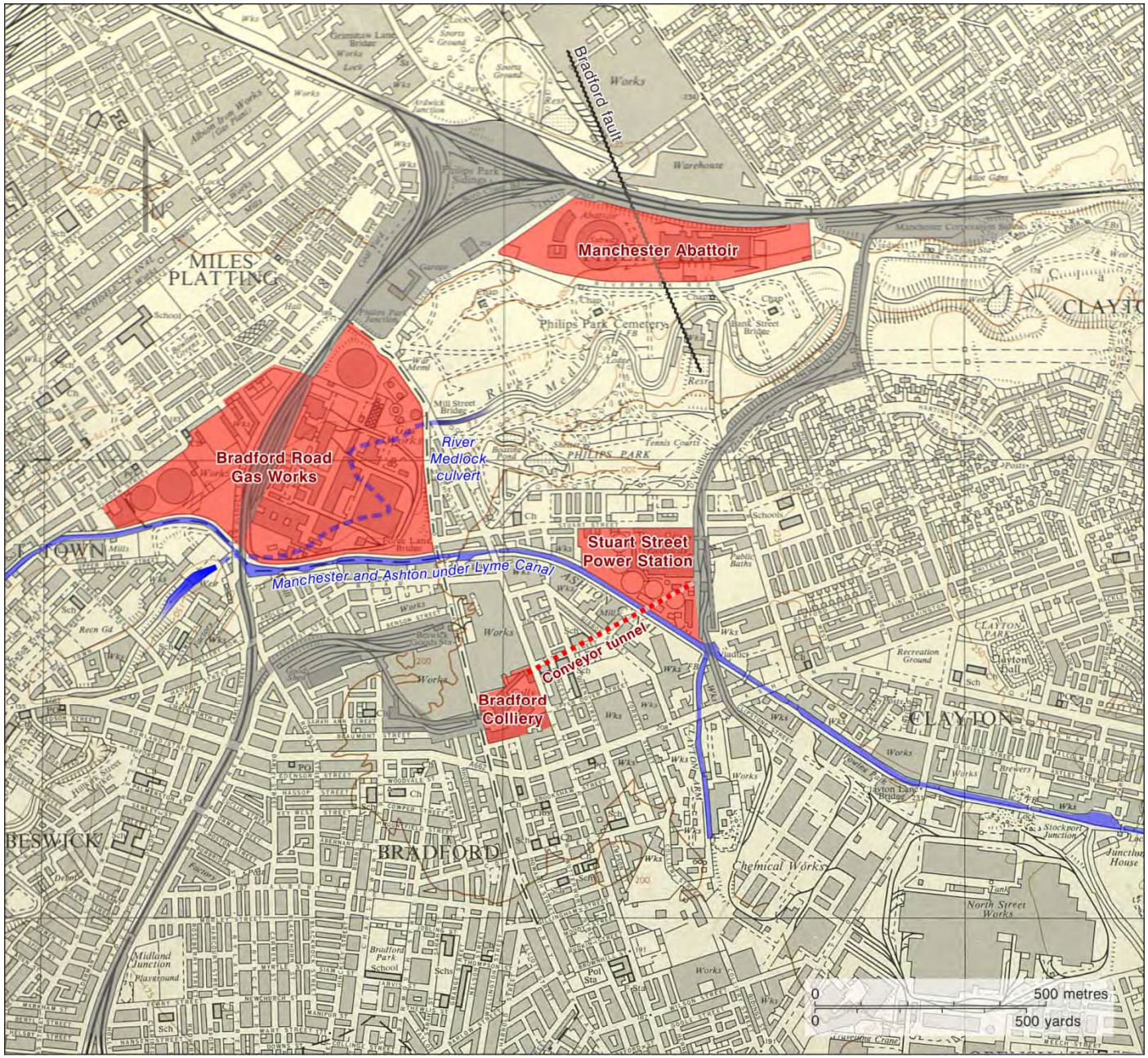
[Ashton Canal opened 1846]

[Philips Park opened 1846]

Bradford Road Gas Works
1877 – early 1970s

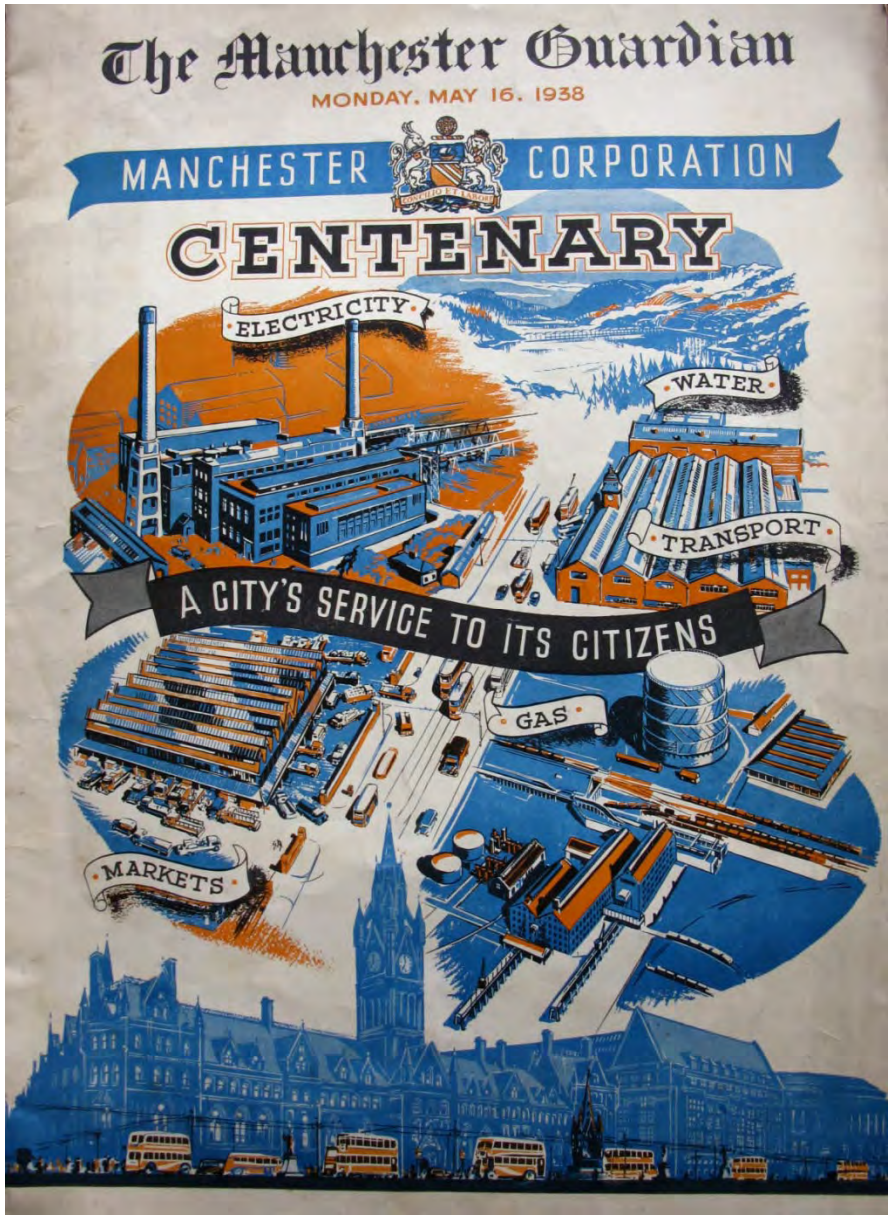
Stuart Street Power Station
1902 – 1976

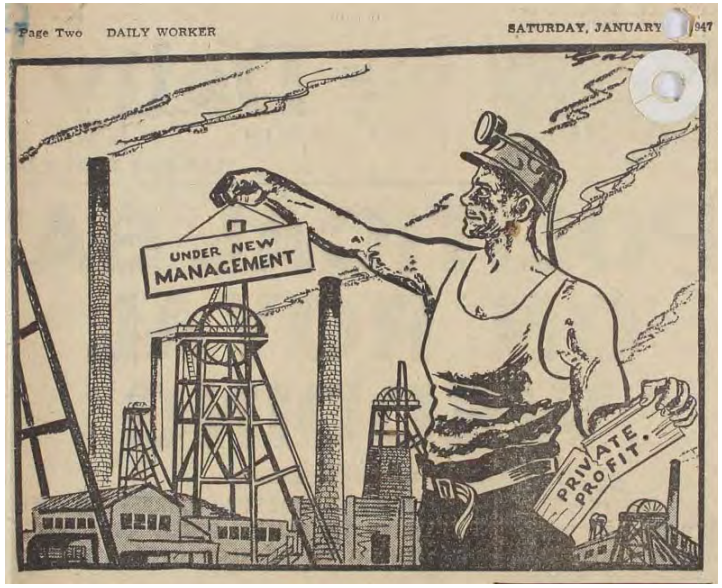
Manchester abattoir
1966 – 2000

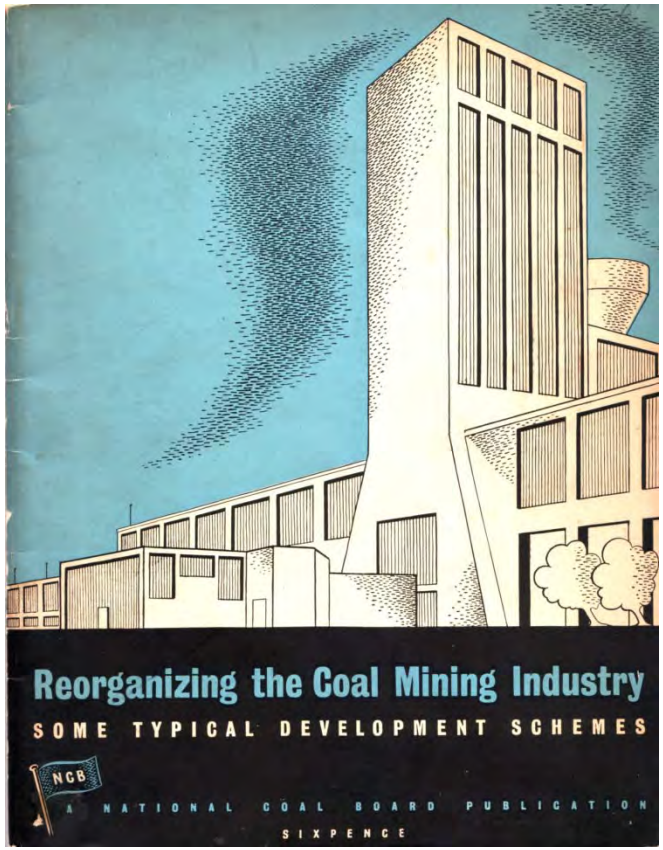


1958

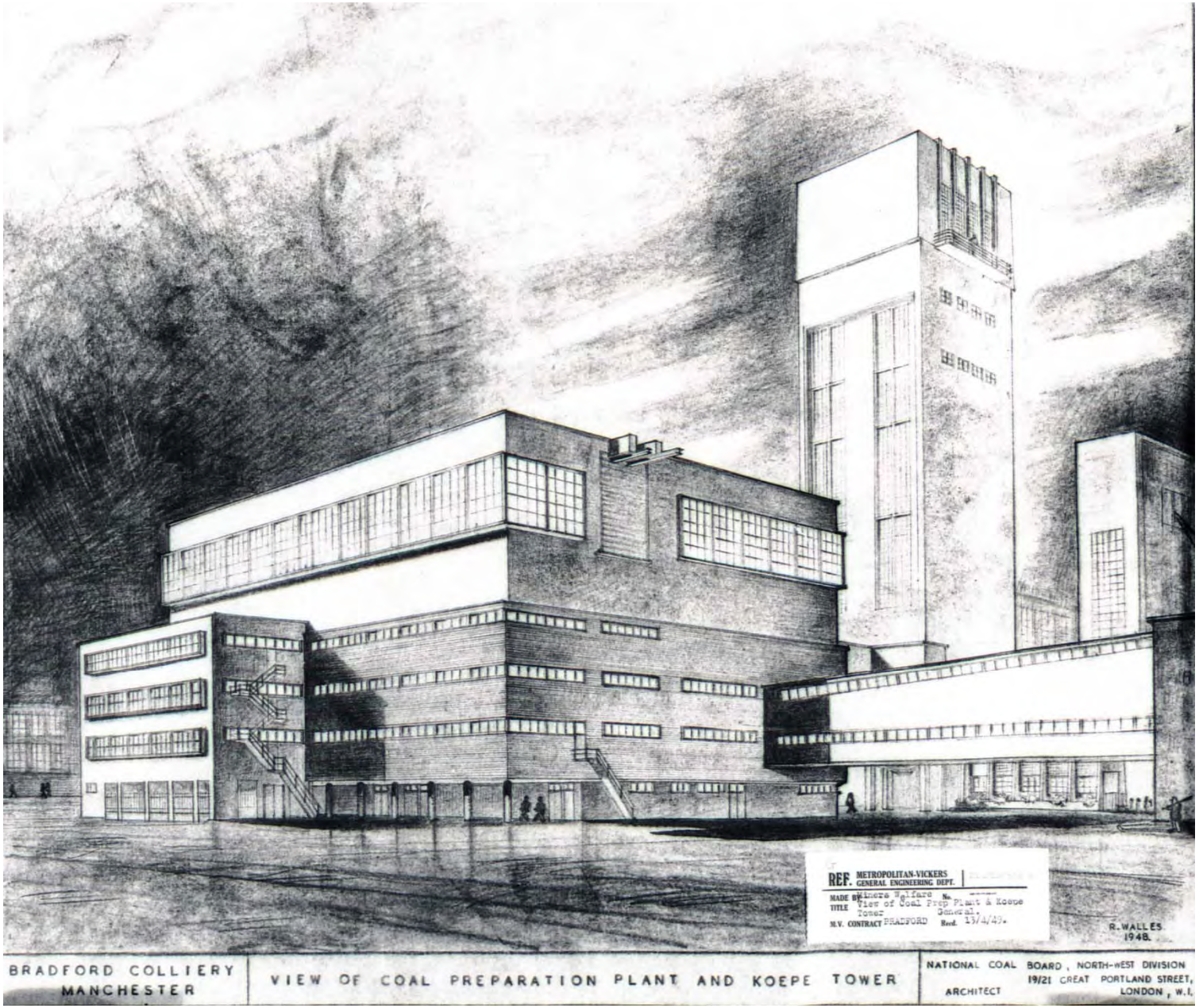
Post-war transformation







Large scale capital investment



Large scale regeneration from late 1980s

COUNTDOWN TO REALITY

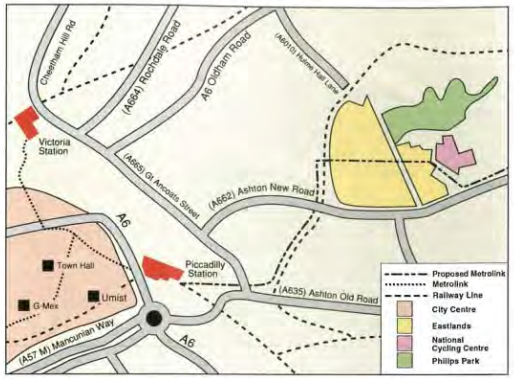
FIRST there was a dream - to bring the Olympic Games to Manchester. That became a vision - to transform a swathe of inner-city land that bore all the evidence of the city's industrial roots into an Olympic Centre for the next millennium.

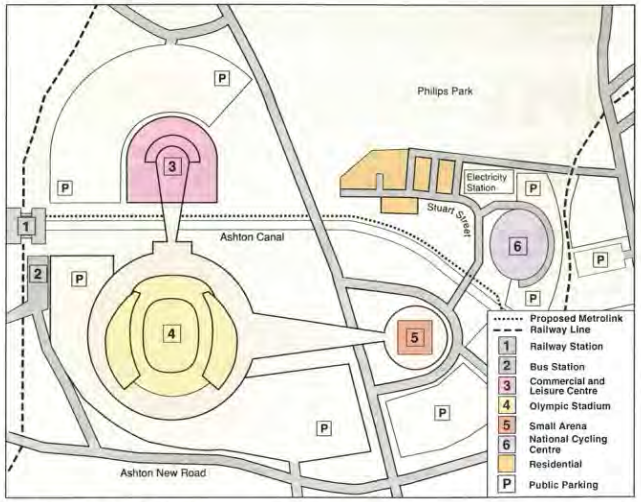
Now the days are counting down for that vision to become a reality, as work begins on Manchester's first purpose-built Olympic facility, the National Cycling Centre at Eastlands, just a mile or so from the city centre.

Eventually, an entire 120-acre East Manchester site - bordered by the National Cycling Centre - will house one of the world's most modern sports, leisure and entertainment complexes. That was the challenge issued earlier this year to more than 250 international architects and developers. They were asked to present designs for a world-beating Olympic Centre at Eastlands - including an 80,000 Olympic stadium, a small arena and a commercial and leisure complex.

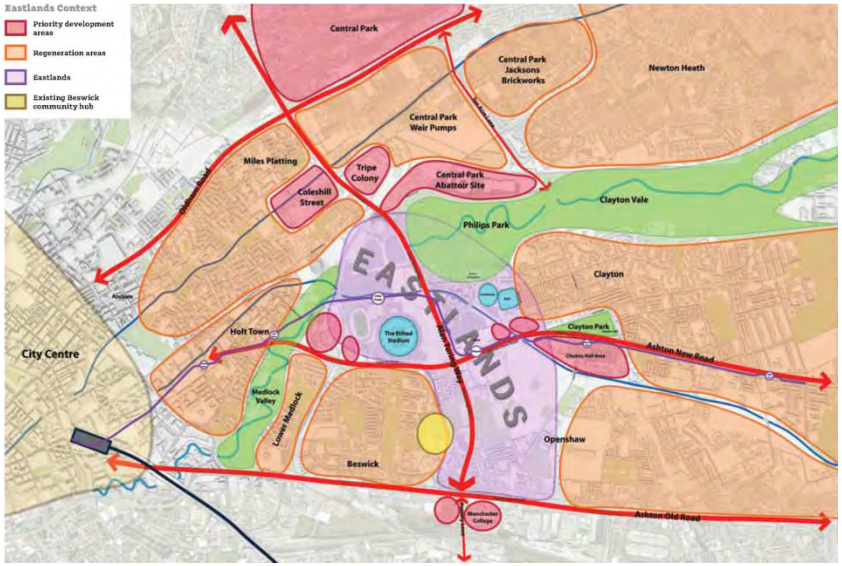
A shortlist has been drawn up, and now the final four consortia are producing their plans for the final stage of the competition. This will be judged by a prestigious Design Panel which includes nominees of the Royal Institute of British Architects, the Royal Institution of Chartered Surveyors and the Royal Fine Art Commission, and which is chaired by David Plowright, a Manchester 2000 committee member and former Chairman of Granada Television.

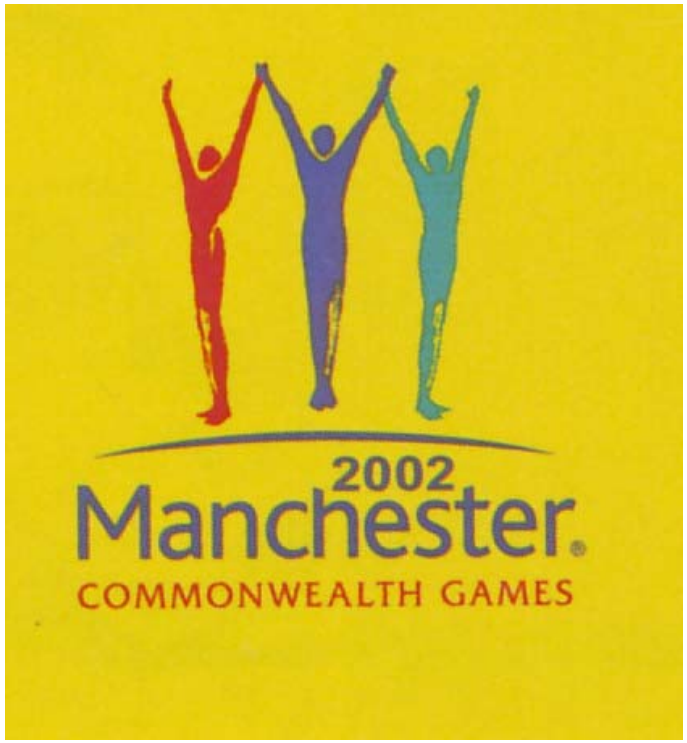
The National Cycling Centre will be breaking new ground - and the plans for the next decade are sure to put the name Eastlands on every competitor and sports fan's lips.





The Olympic site at Eastlands



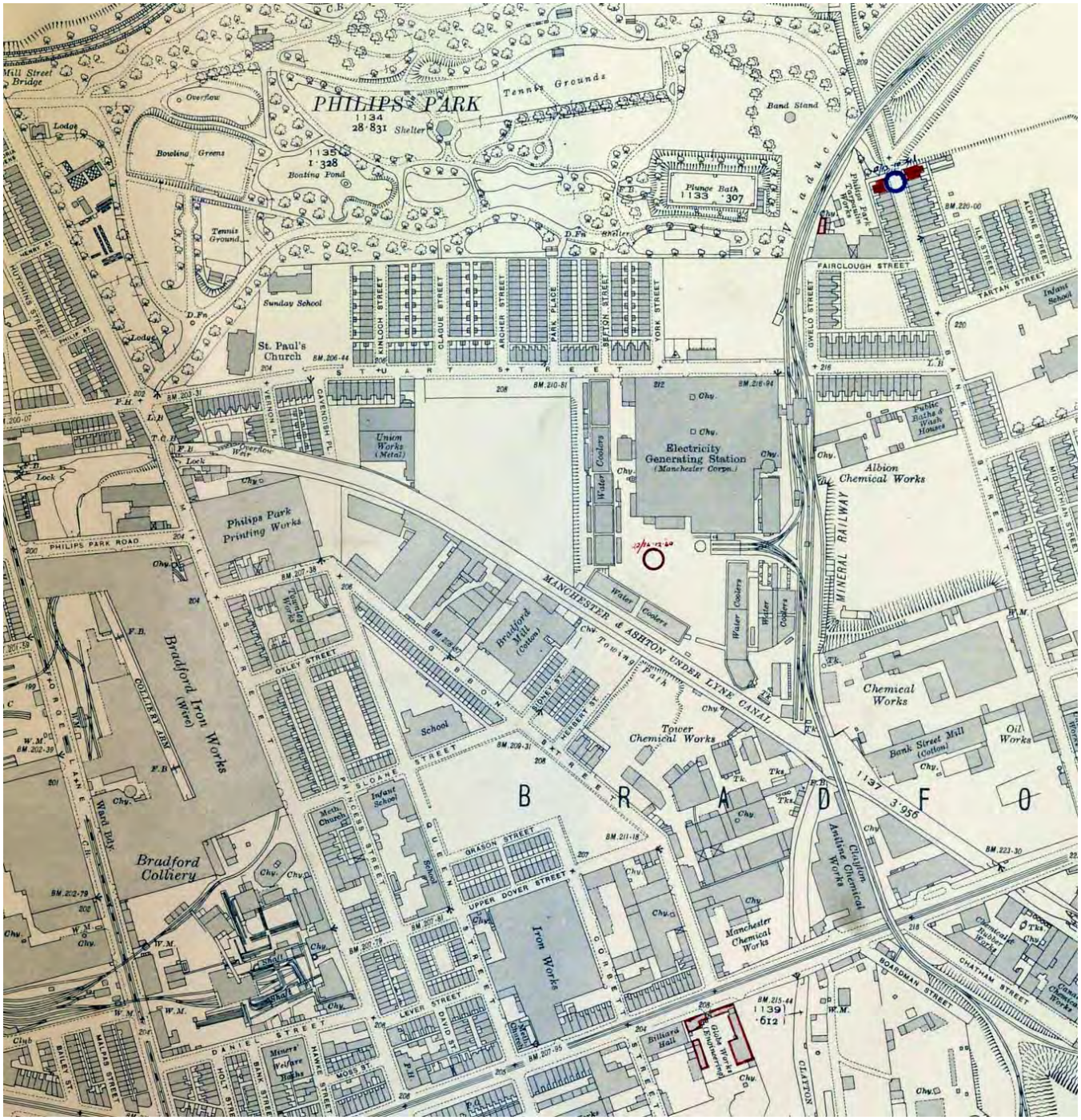


ALEX LIVESEY/GETTY IMAGES EUROPA/GETTY IMAGES

Means of recovery through historic visual representations

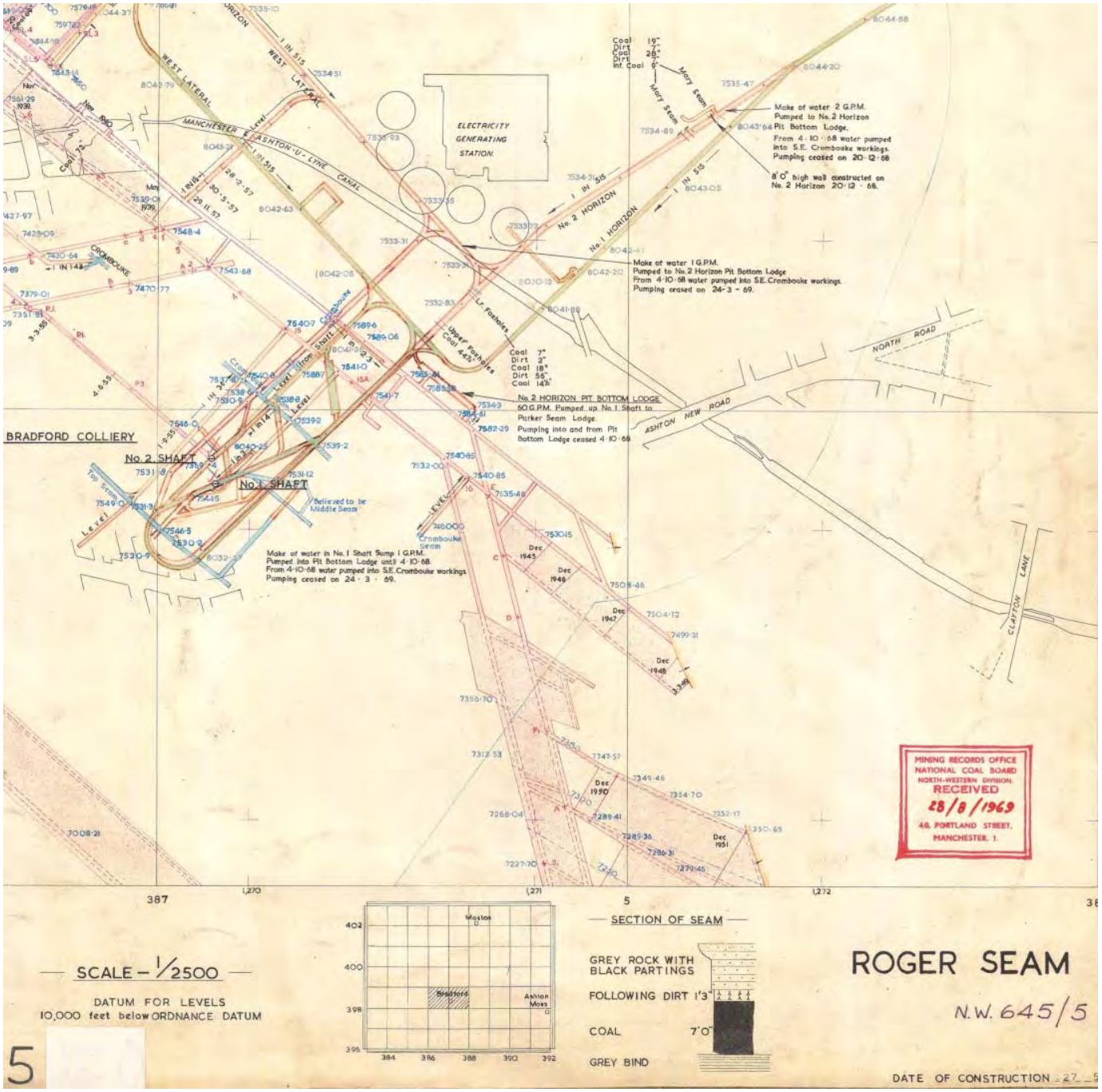
- How far can essence of these coal-fuelled power infrastructures be narrated
- Cartographic
- Photographic
  - Aerial perspectives, street photography
- Diagrammatic
  - Architectural drawings
  - Process diagrams, technical inscriptions
- People ….?

Cartographic



Ordnance Survey

- Update frequency and date of publication
- Scale limits detail
- Surveyors' rules on industrial works; functional elements not labelled
- Access and copyright



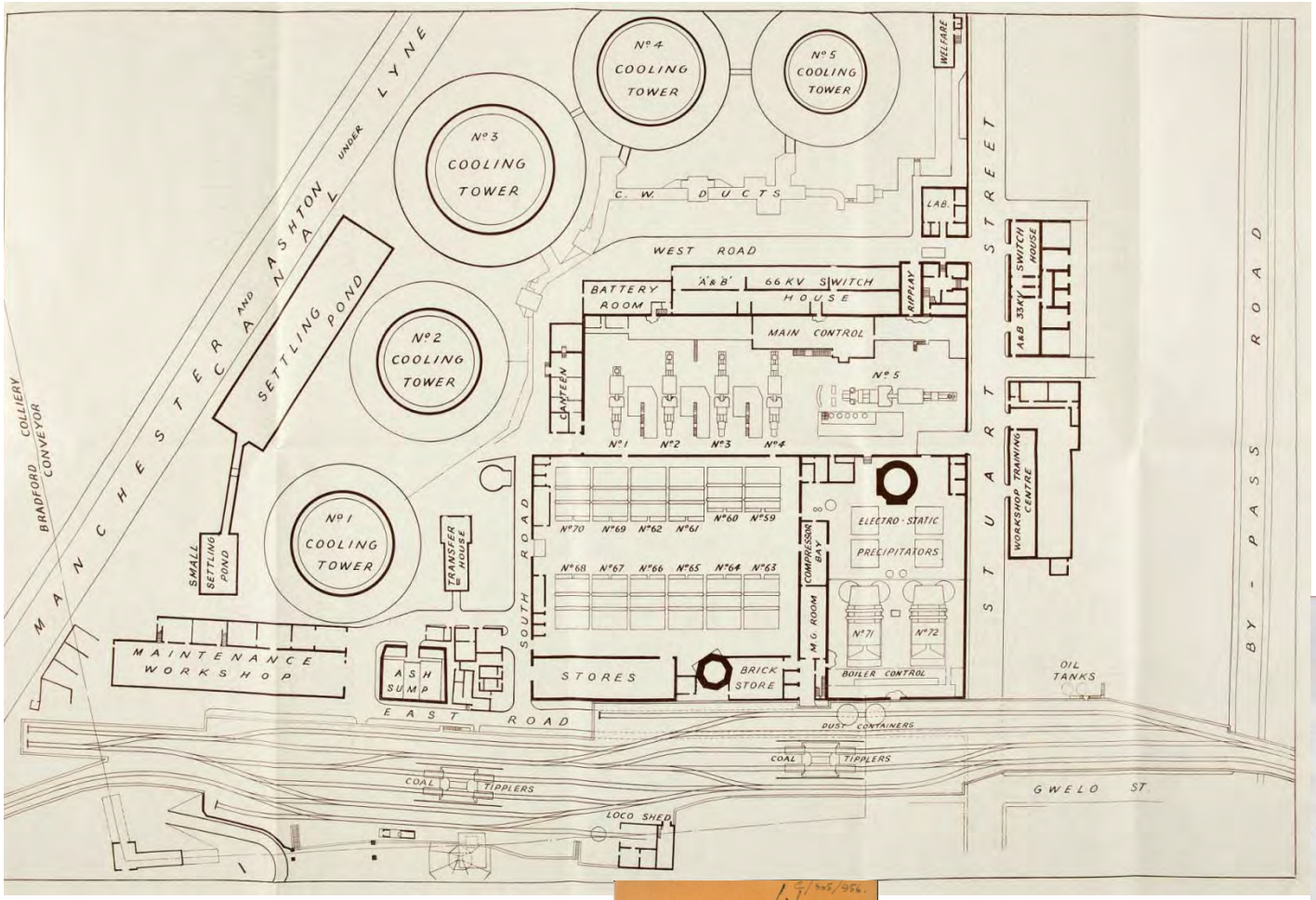
Coal Authority

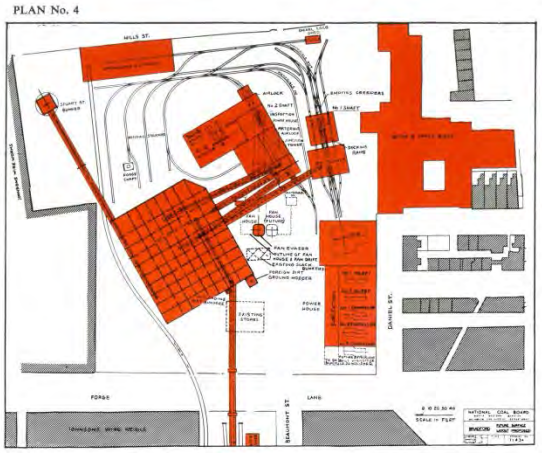
Abandonment plans

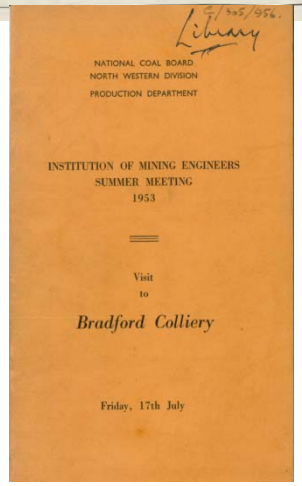
- Weak cataloguing
- Specialised domain, nomenclature that excludes
- Had to visit and to negotiate
- I was an 'unsusual' enquiry, mostly they deal with land agents, developers, utilities,

Site Plans

- Can be in public archives (e.g. gas works)
- Training booklets for new staff
- Promotion leaflets for engineering visitors







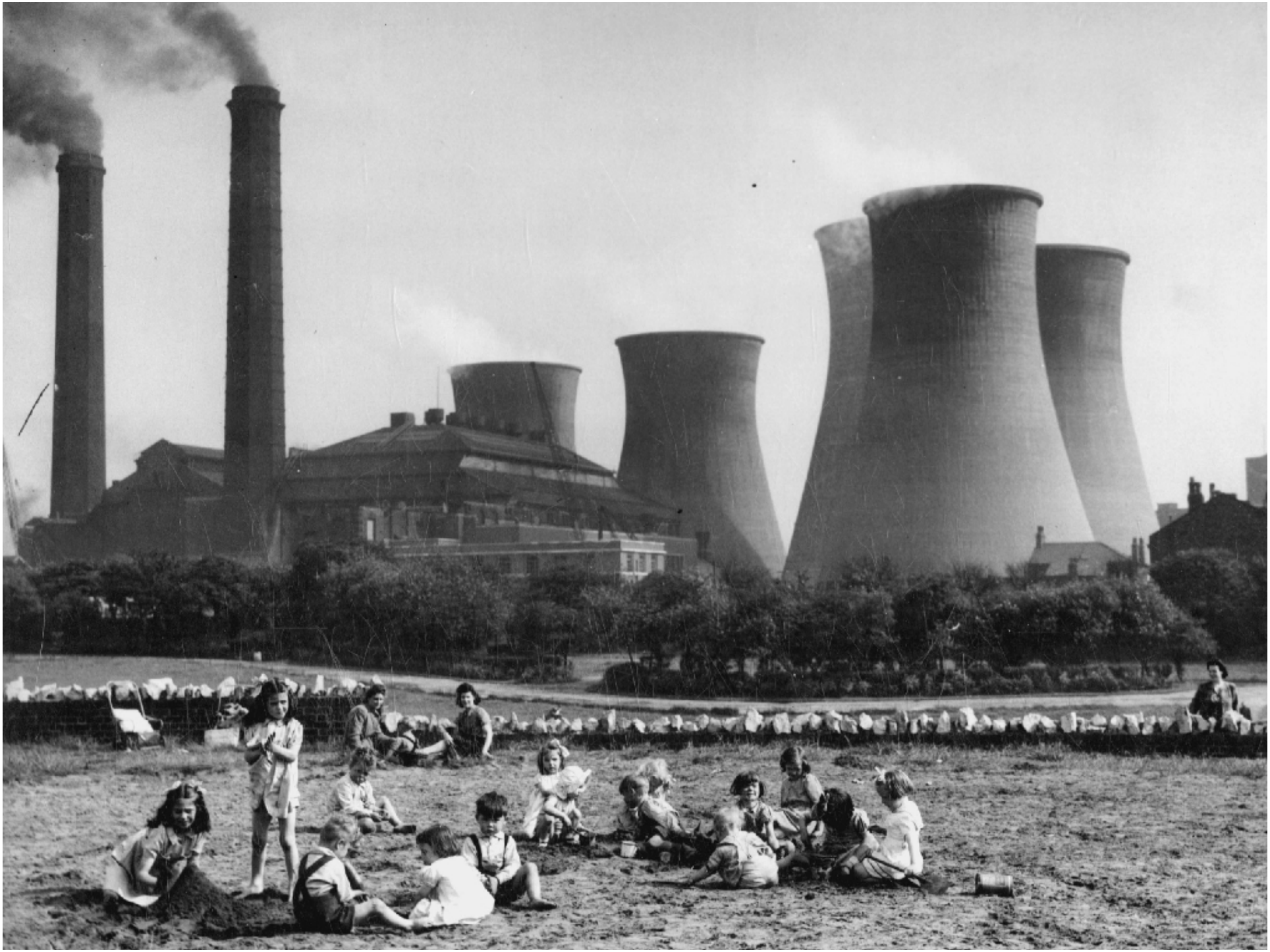
Photographic

Street level documentary photography

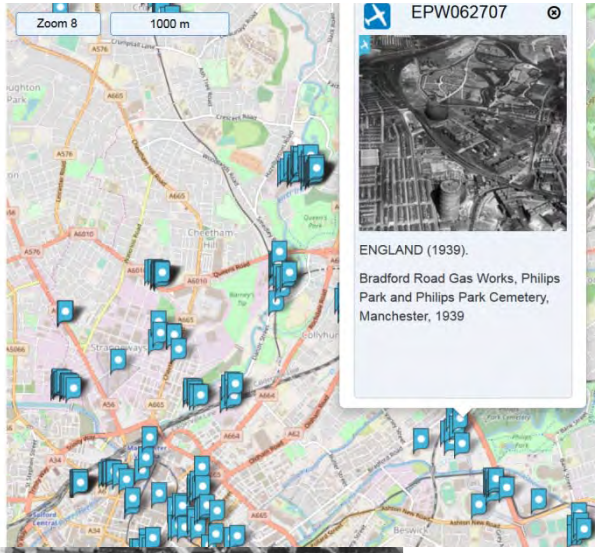
- Benefits
- Weakness
- Pot luck on dates, quality
- Access and findability

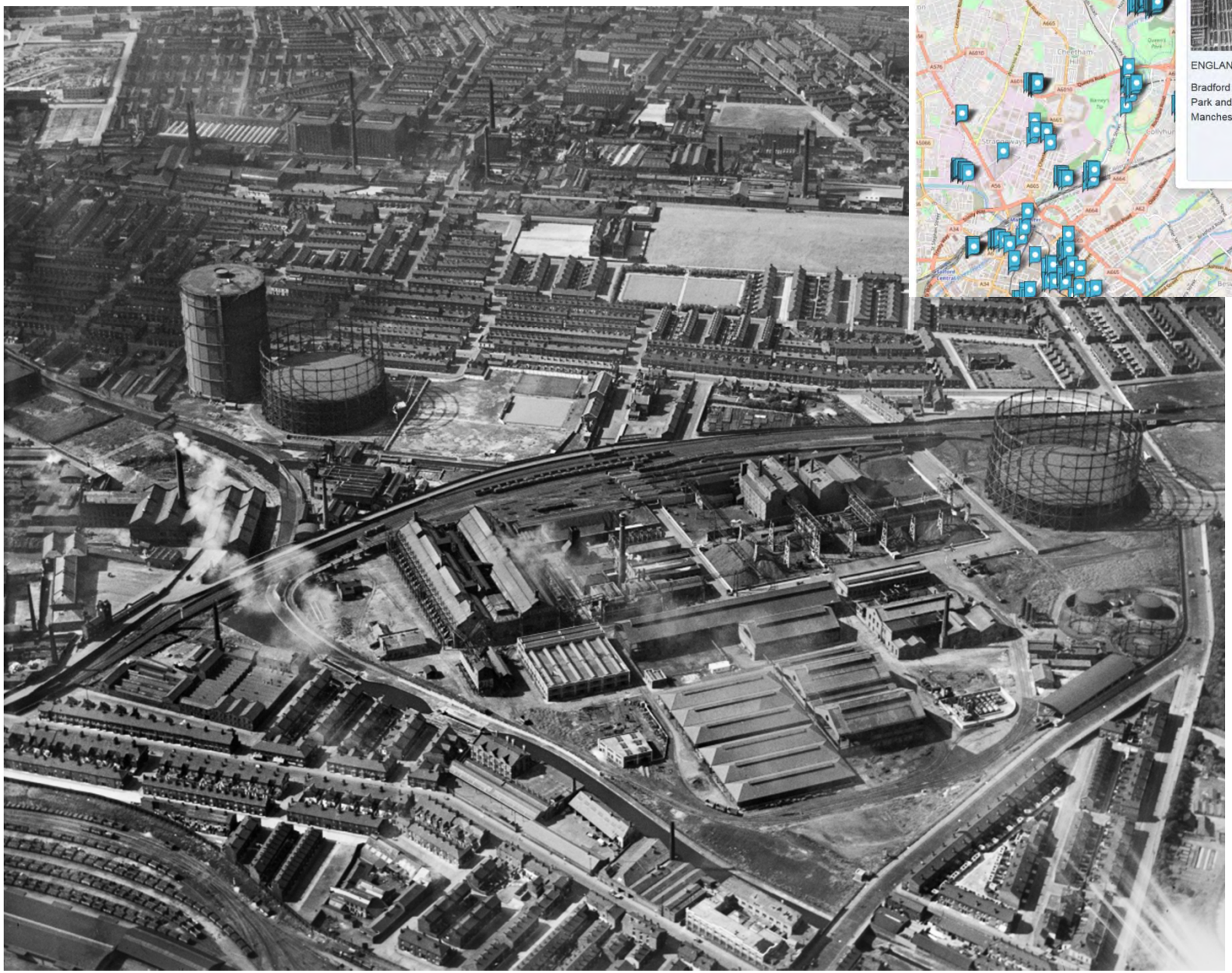
- Manchester – rich local image collection, Documentary Photography Archive, Town Hall Photographer's Collection

Visual Icons of infrastructure marked against the Bradford skyline, casting long shadows on surrounding streets and the scale of domestic life



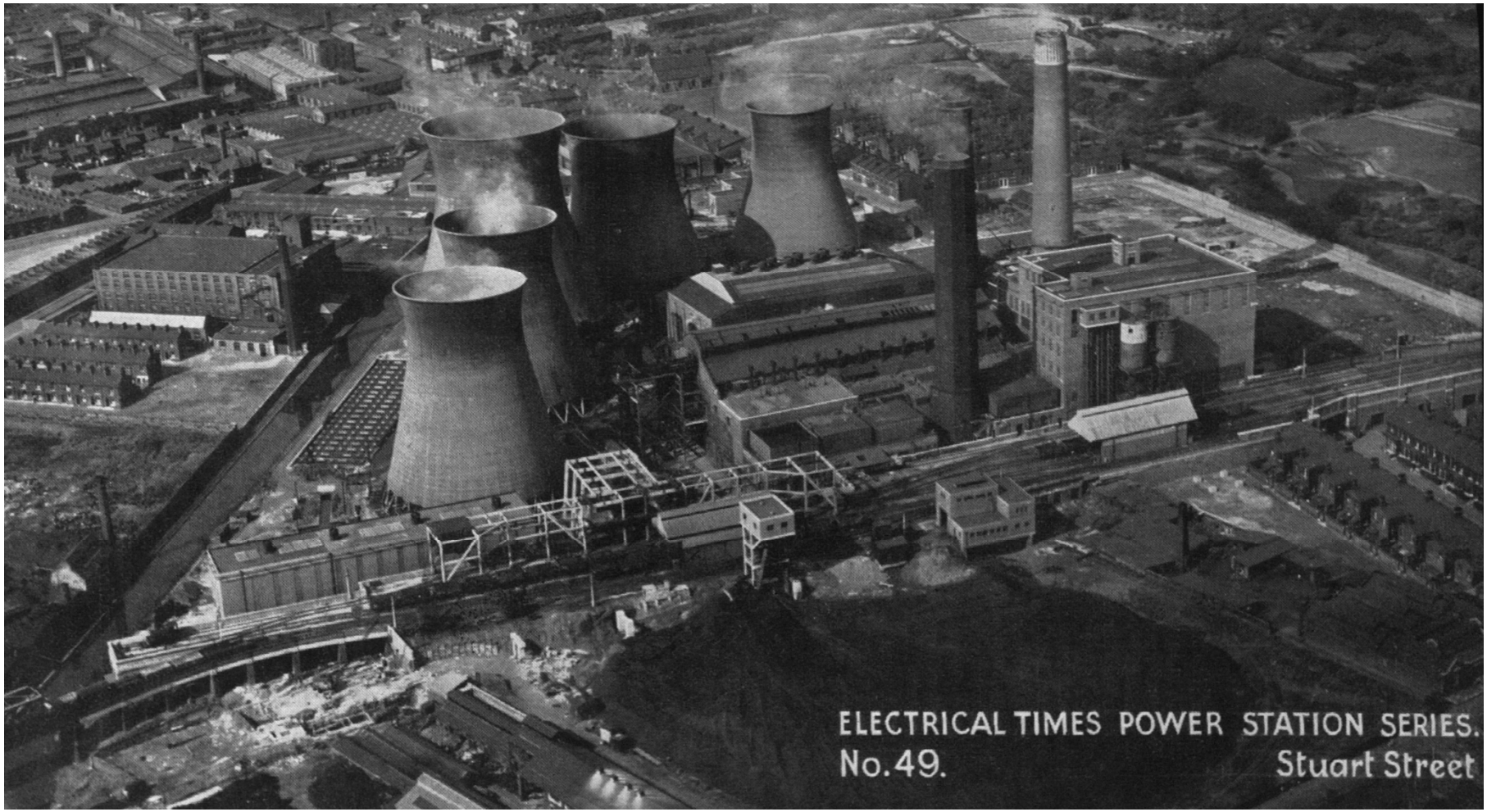
Britain from Above





1939

Site reports in specialist industry periodicals

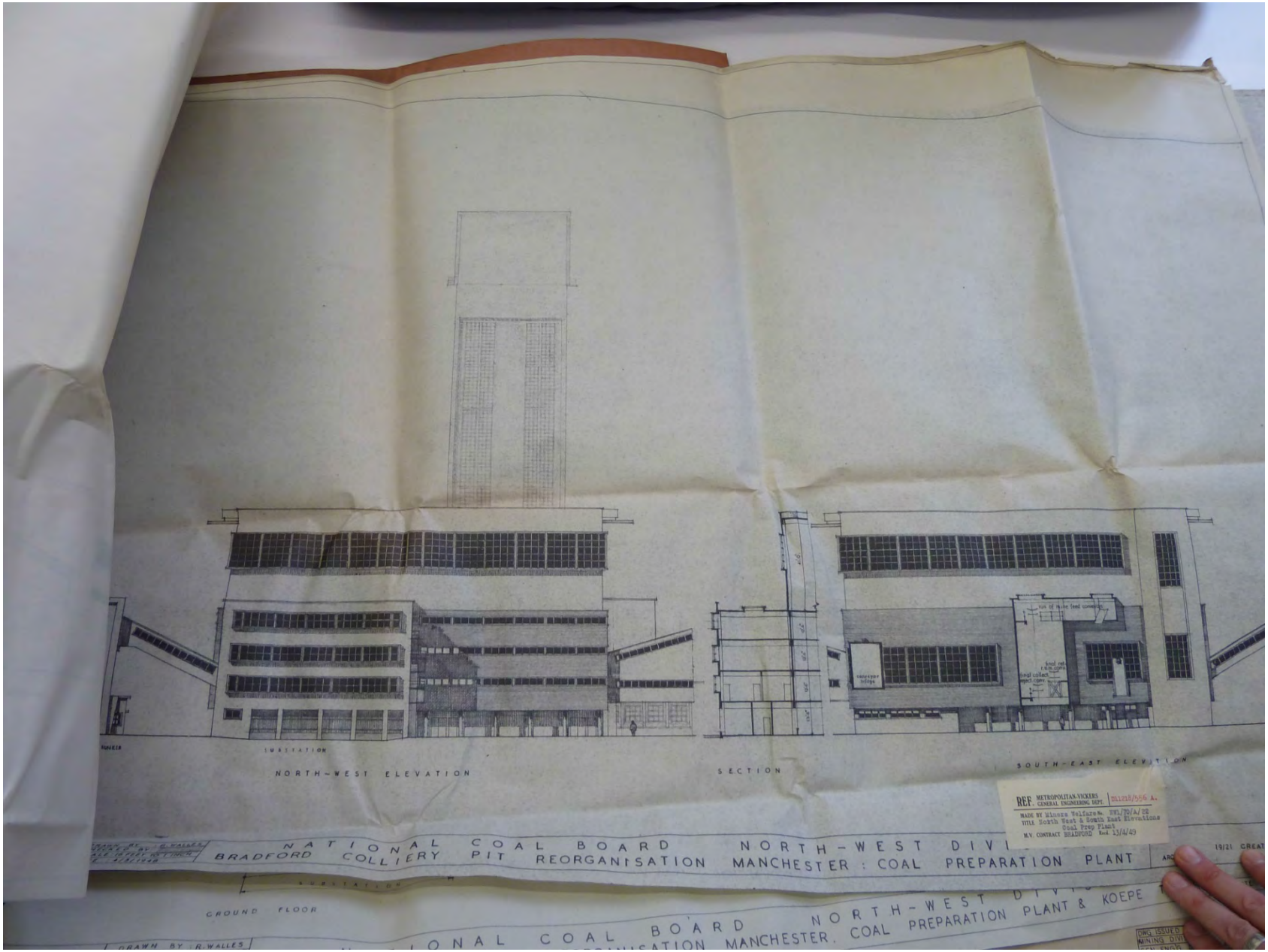


Electrical Times, 16th March 1950


Google earth

Diagrammatic

Building control plans. But architecture of infrastructure poorly recorded / archived



Gaps in the archive

CEMETERY ROAD/BRISCOE LANE, NEWTON HEATH.

CITY ABATTOIR.	48744
CANTEEN AND RECREATIONAL CLUB,	
MARKETS COMMITTEE	8.8.61
APP. BLS. & T.P. 12 SEP 1961	

(107)

CEMETERY ROAD/BRISCOE LANE, NEWTON HEATH

CITY ABATTOIR	48744
DRAINAGE SCHEME TO SLAUGHTER HOUSE	
MARKETS COMMITTEE	28.8.61
APP. BLS. & T.P. 10 OCT 1961	

(107)

CEMETERY ROAD/BRISCOE LANE, NEWTON HEATH

CITY ABATTOIR	48744
COLD STORE	
MARKETS COMMITTEE	25.8.61
APP. BLS. & T.P. 10 OCT 1961	

CEMETERY ROAD BRISCOE LANE & TEN ACRES LANE. NEWTON HEATH

SITE BOUNDED BY:	48744
WATER STORAGE TANK AND VALVE CHAMBER TO	
PROPOSED ABATTOIR.	15/2/60
MARKETS COMMITTEE (D)	8 MAR 1960
ITEM 2 - DETAILS OF REINFORCED CONCRETE TO	APP. BLS.
WATER STORAGE TANK	5/3/60
(D) 9 MAY 1961 APP. BLS (CONSENT GRANTED PREVIOUSLY UNDER T.P.)	
ITEM 3 - MAIN DRAINAGE SCHEME	29.6.61

https://extranet.nationalgrid.com/GasArchive/Research.htm

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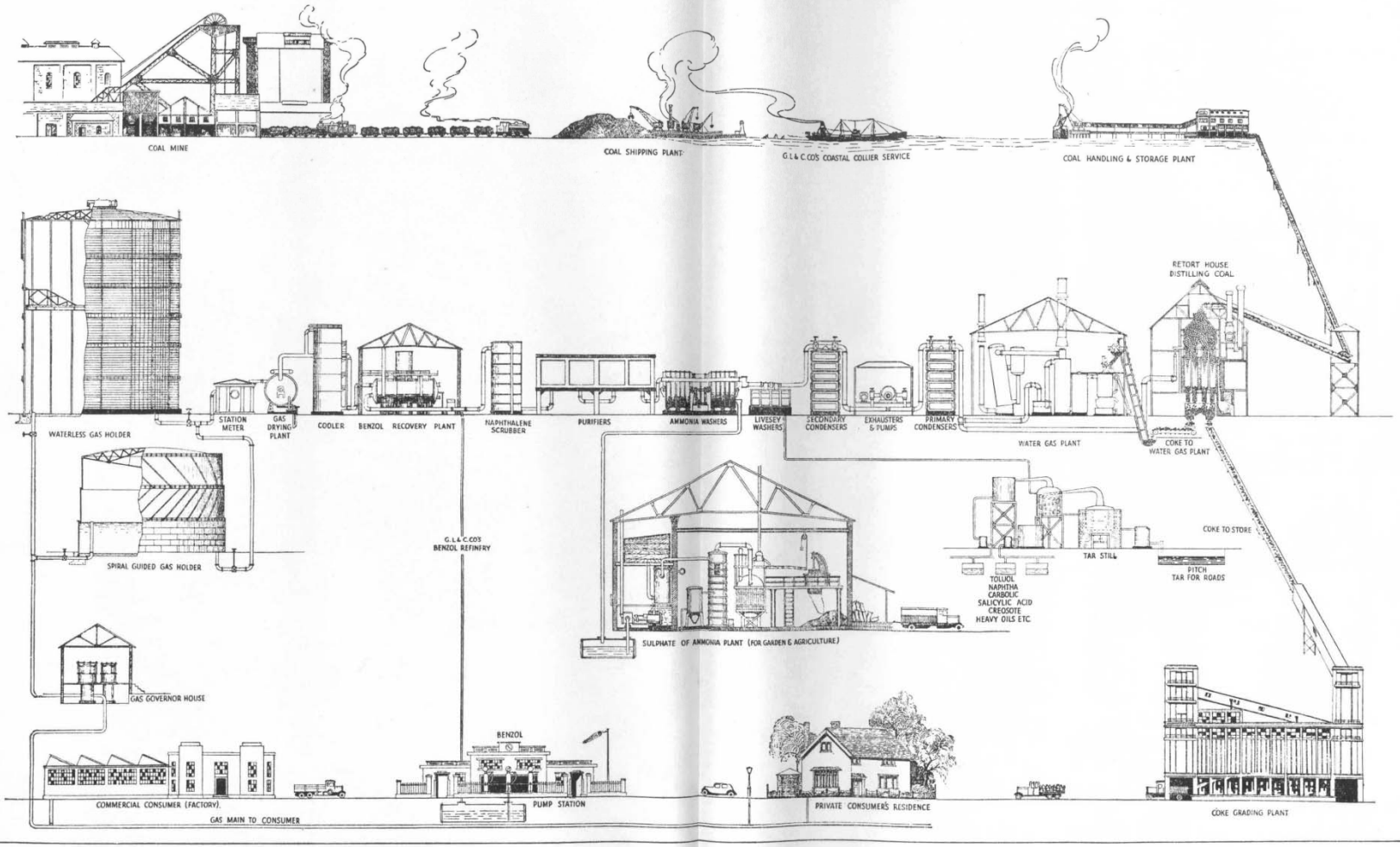
Location	Small Map
Opening Hours	Mon to Thurs 10.00 am - 15.30 pm Appointments need to be made when visiting.
Access	Access is restricted for some material
Enquiries	Enquiries preferred in writing (e-mail / letter)
Facilities	Photocopier Microfilm/fiche reader & printer Search room Library
Charges	A search fee applies for all enquiries. Please contact for details of other charges .Income received from searches is re-invested in the services provided by North West Gas Historical Society.

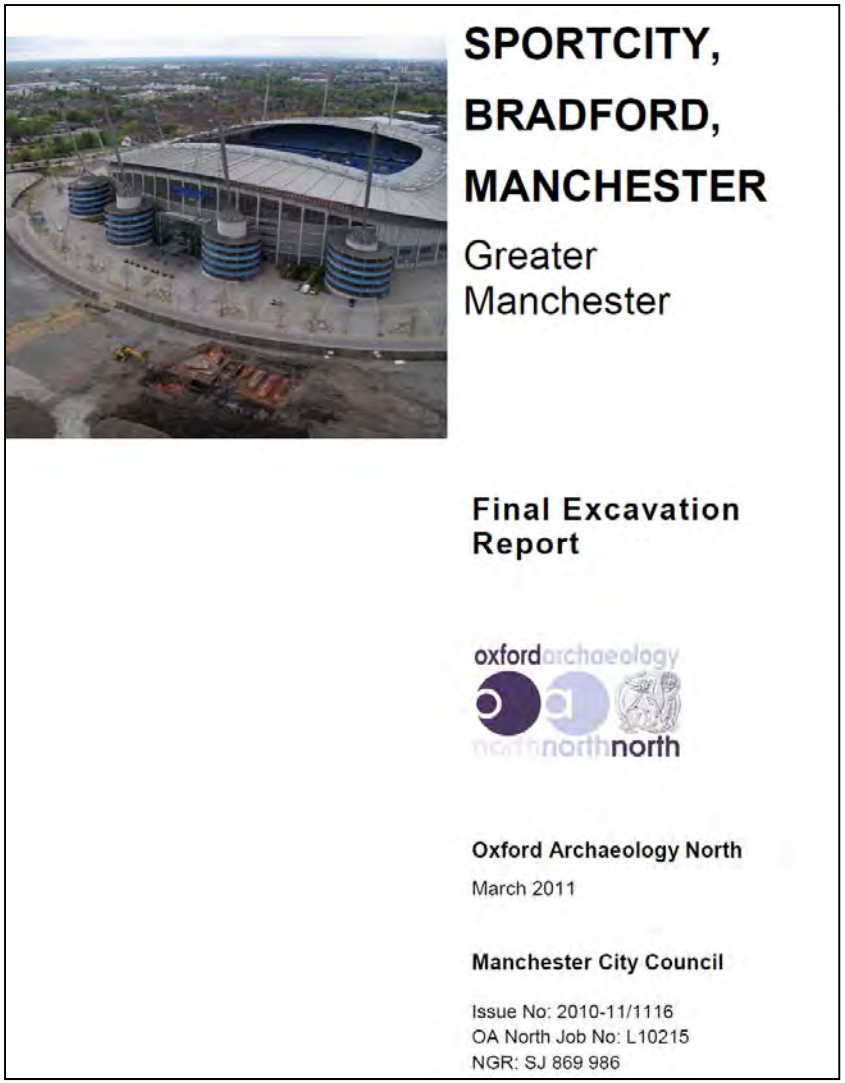
Electricity industry archives much more fragment following nationalisation and privatisation

FROM COAL MINE TO CONSUMER

THE MAKING OF GAS AND BY-PRODUCTS



Archaeological modes of inscription



SPORTCITY,

BRADFORD,

MANCHESTER

Greater Manchester

Final Excavation Report

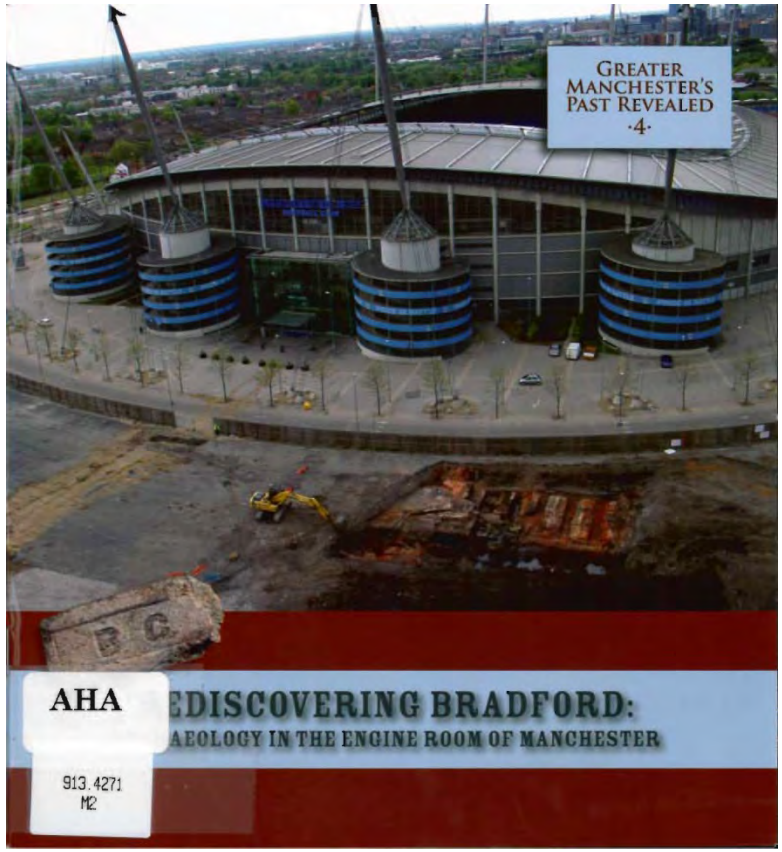
oxfordarchaeology
northnorthnorth

Oxford Archaeology North

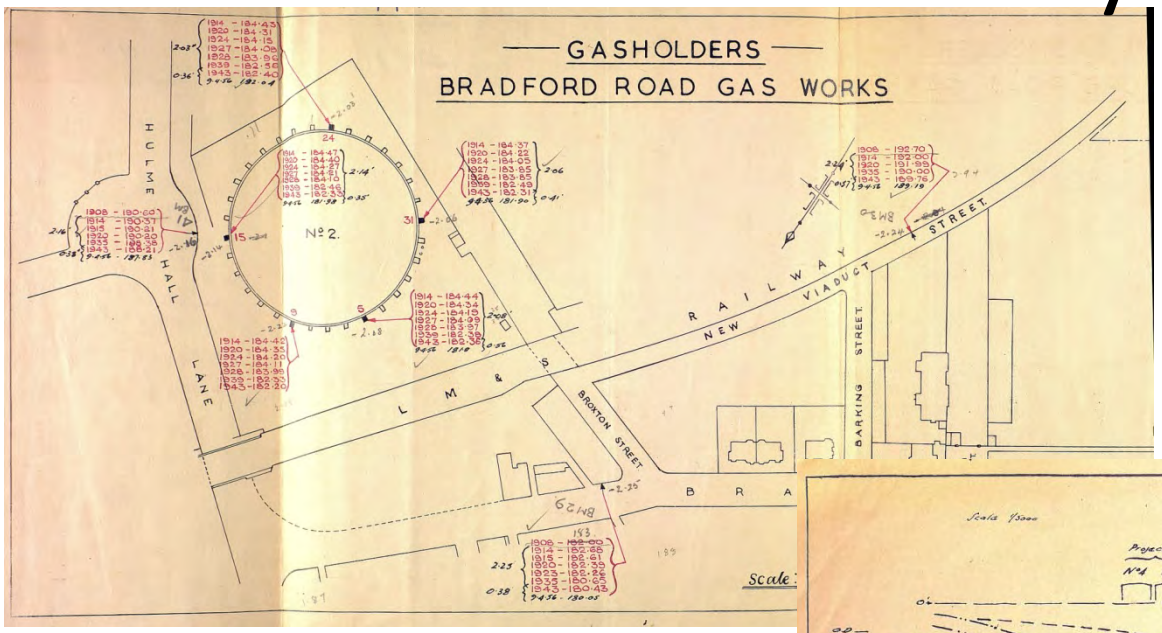
March 2011

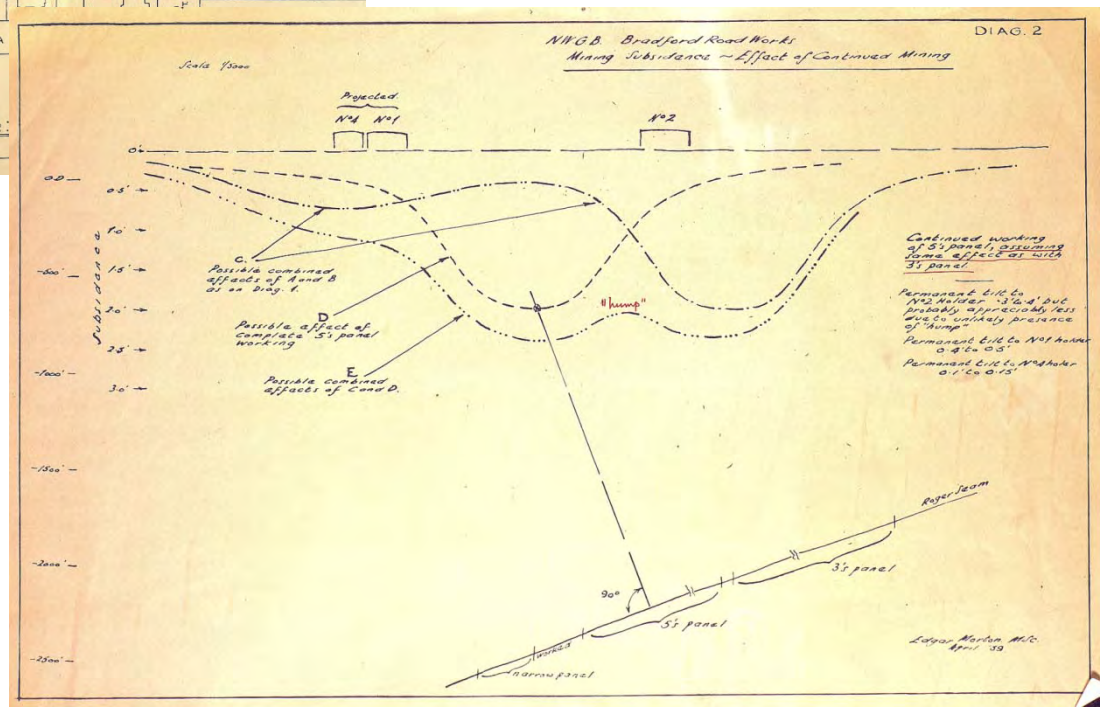
Manchester City Council

Issue No: 2010-11/1116
OA North Job No: L10215
NGR: SJ 869 986



Lucky finds, local access: Edgar Morton archive held by UoM





Murky copyright on such material: Creator, the paying client, the archive collection, but it's the researcher's photo

Important to properly acknowledge sources but can treat as 'fair use'?

Avoiding human subjects at all cost

- Why not just speak to people – former workers, industry managers, local residents??
- Time consuming and need to be sensitive (lazy academics and somewhat autistic). Ethics approval
- Unreliable witnesses, partial viewpoints
- But really needed for ‘deep mapping’

BRADFORD PIT

About | Contact | Community | Archive | Tags | Your stories ...

The Bradford Pit Project works with the surrounding communities in a range of ways that aim to educate and engage a new audience about the history of the pit and it's legacy, much of which is still relevant today.

We involve people of all ages, cultures and backgrounds and welcome any kind of public input in order to integrate communities through their heritage.

Look at some of our recent community based projects wherever you see this tag #community.

Add your own stories to our archive in the your stories section.

SOUNDCLOUD | Charts | Search for artists, bands, tracks, podcasts

Archives+

Bradford Pit

2 years ago

#Oral History

0:57 | 2:34

Like | Repost | Share | Add to Next up

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141 382

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The Bradford Pit Project commemorates the colliery that used to stand on the site now occupied by SportCity and the Etihad Stadium. It was set up to ensure that the people and places that contributed to development of Manchester will be marked and celebrated.

The project explores how people connect to their environments heritage, when all physical evidence has been removed. Etihad campus is what stands today where Bradford Colliery used to be, a site far removed from the desolate wasteland which remained for years after the pits demolition. Project co-ordinated by Lauren Murphy

Show more

1 David Woods: safety and camaraderie at Bradford Pit (extract)

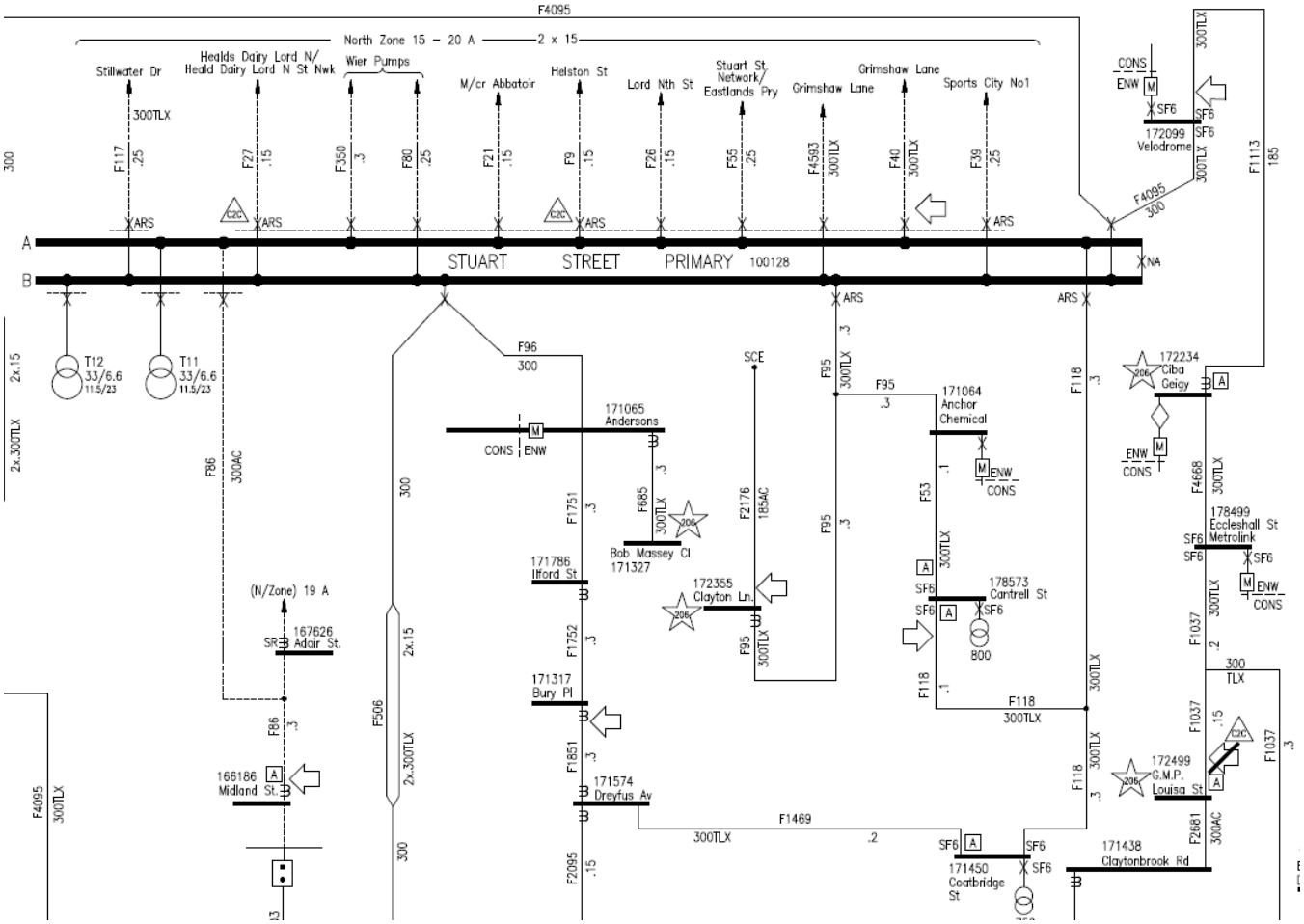
2 Janice Jones: father's Bradford Pit accident (extract) 60

3 John Alan Stott: quality of coal at Bradford Pit (extract) 45

4 Michael Doherty: changes to Bradford, Manchester (extract) 51

5 Ethel Goldsworthy: Bradford Pit visit for miners wives (extract) 42

Conclusion



Much can be recovered from public visual archive

But the process of production within site is hard to understand and ‘see’

Hard to understand the changing network connections

But these have left real legacies behind

“To this day the sites and names of the first power stations to be built form the basis for the modern electricity distribution network. For example, central Manchester’s are still labelled Bloom Street, Stuart Street and Frederick Road after the power stations that used to supply them.”

References and image sources:

- Slide 1: Aerial photograph of Bradford area, c.1958. Courtesy of Manchester Archives+ and taken from Manchester Local Image Collection, ref. m75968; with some colour manipulation by author.
- Slide 3: Quote from Cosson from "Inherited infrastructure", *Conservation Bulletin*, vol. 65, 2010 (English Heritage). Available from https://historicengland.org.uk/images-books/publications/conservation-bulletin-65/
- Slide 4: Image of Fred Dibnah demolishing a factory chimney taken from https://www.youtube.com/watch?v=DMCSSMoPELU. Logo for the 2018 European Year of Cultural Heritage from http://industrialheritage.eu/EYCH2018/May/In-memoriam-for-a-chimney
- Slide 5: Report cover image and quotation taken from Clarke J, 2015, *'High Merit': Existing English Coal and Oil-fired Power Stations in Context* (Historic England). Available from https://research.historicengland.org.uk/Report.aspx?i=15846
- Slide 6: Author screengrabs of online newspaper articles: Williams J, 2017, "What will happen to East Manchester's iconic gas holders?", *Manchester Evening News*, 8 December, www.manchestereveningnews.co.uk/news/greater-manchester-news/what-happen-east-manchesters-iconic-14011886; Anon., 2018, "Salford community songs and jam to save dirty old town gasworks", *Salford Star*, 10 June, www.salfordstar.com/article.asp?id=4556
- Slide 7: Author image. Map created by Graham Bowden, Cartography Unit, University of Manchester.

- Slide 8: Aerial photograph of Bradford area, c.1958. Courtesy of Manchester Archives+ and taken from Manchester Local Image Collection, ref. m75968.
- Slide 9: Author images.
- Slide 10: Architectural sketch of the redevelopment of Bradford colliery, 1949. Courtesy of Manchester Archives+, Building Control archive, ref. GB127.M900/1/1/2/19/29463
- Slide 11: Left image, author scan from Manchester Olympic bid document. Top right image of strategic plan for the area taken from *Eastlands Regeneration Framework: A strategic framework for Eastlands* (Manchester City Council, 2011), p.21. Bottom right photograph of B of the Bang billboard by Flickr user 'radclifferaz', 4 October 2005, www.flickr.com/photos/bury_interchange/5515485970.
- Slide 12: Left photograph by Flickr user 'Mikey', 30 March 2012, www.flickr.com/photos/raver_mikey/7317490692/. Bottom right photograph of Man City FC celebration, Alex Livesey/Getty Images, www.theepochtimes.com/manchester-city-cap-riveting-premier-league-season-with-second-title-in-three-years_671336.html
- Slide 15: Author extract from the Second World War bomb damage map for Manchester showing Stuart Street power station and Bradford colliery; digitised version available, https://luna.manchester.ac.uk/luna/servlet/s/mpnvs7. Courtesy of Manchester Archives+ and the University of Manchester Library. The map is an Ordnance Survey 25" Inch, sheet Lancashire CIV 8, 1934.
- Slide 16: Author extract from map of mine workings of Bradford colliery, 1954. The mine went out under much of east Manchester. Courtesy of the Coal Authority, ref. NW645.
- Slide 17: Plan of Stuart Street power station and cover of *Your Job* booklet courtesy of Museum of Science and Industry, ref. YA2000.2/11. The Bradford Colliery visitor booklet, 17th July 1953, courtesy of Alan Davies.

- Slide 19: The view from Ashton New Road, looking along Hawke Street, to the main building of Bradford colliery and the two tall pithead towers. Photographer H. W. Beaumont, 1959. Courtesy of Manchester Archives+ and taken from Manchester Local Image Collection, ref. m12339.
- Slide 20: Waste ground behind Mayor Street and Cuthbert Street, Miles Plating, with the skyline filled by Bradford Road gasometers. Photographer unknown, 1946. Courtesy of Manchester Archives+ and taken from Manchester Local Image Collection, ref. m75511.
- Slide 21: View of Philips Park with dominating presence of Stuart Street power station. Courtesy of Manchester Archives+ and taken from Manchester Local Image Collection, ref. 58456.
- Slide 22: Aerial photograph of Bradford Road gas work, 1939. Courtesy of *Britain from Above* (English Heritage), ref. EPW062706.
- Slide 23: Author scan of an oblique aerial photograph of the Stuart Street power station from *Electrical Times*, 16th March 1950.
- Slide 24: Satellite image of the Bradford area in 2000 with construction of the City of Manchester stadium underway. Courtesy of Google Earth.
- Slide 26: Author photograph of an original drawing of an architectural elevation of the redevelopment of Bradford colliery, 1949. Courtesy of Manchester Archives+, Building Control archive, refs. M900/1/1/2/19/29463.
- Slide 27: Author scan of the index cards for Building Control plans for Manchester abattoir. Photograph of the rear of the abattoir complex taken by F. Hotchin, 1965. Courtesy of Manchester Archives+ and taken from Manchester Local Image Collection, ref. m56753.

- Slide 28: Author screenshot of the National Gas Archive website, https://extranet.nationalgrid.com/GasArchive/. Author photograph of some of the historic plans of gas works in Manchester held by the National Gas Archive.
- Slide 29: Process diagram scanned from Smith N, 1945 *Gas Manufacture and Utilization* (British Gas Council), p.34.
- Slide 30: Author scans of report and booklet covers.
- Slide 31: Author photographs of plan and chart from the archives of consulting work of Edgar Morton, c.1950s. Courtesy of the University of Manchester Library, ref. EM/3/530/a #14.
- Slide 33: Author screenshots of http://bradfordpit.com/ and https://soundcloud.com/archivesplus/sets/bradford-pit.
- Slide 34: Author extract of 11kv electricity distribution network chart for Manchester South, 2014. Courtesy of Electricity Northwest.