Spring 2011

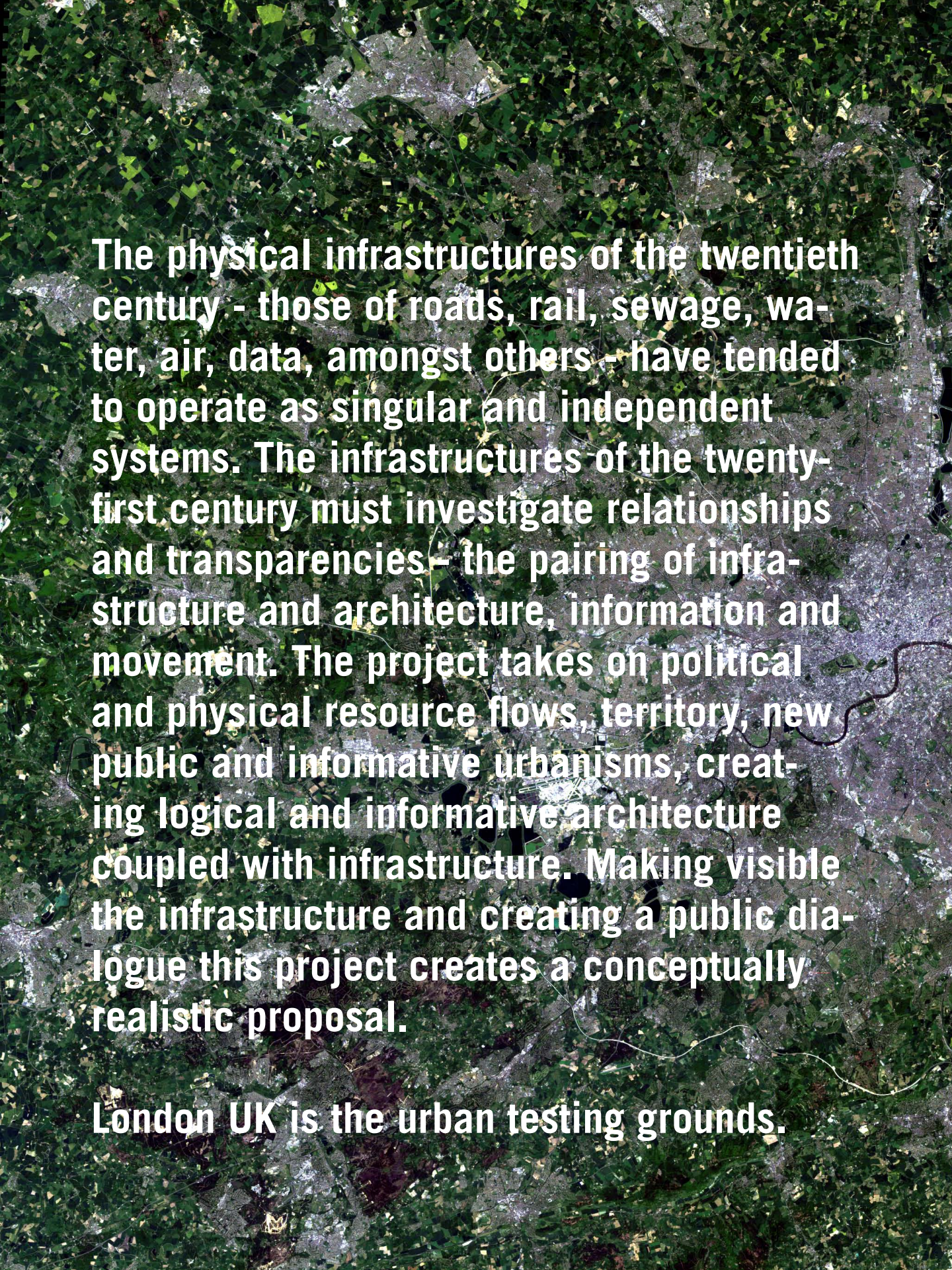
Liquid Infrastructure: Transnational Spaces of Water

Timothy Gale
Syracuse University

LIQUID INFRASTRUCTURE

MARSEILLES FR - WATER IS EXTRACTED UNDER PRIVATE MANAGEMENT

WATER PIPED ACROSS LAND UNDER GOVERNMENTAL REGULATION AND SHIPPED TO UK UNDER PRIVATE REGULATION



The physical infrastructures of the twentieth century - those of roads, rail, sewage, water, air, data, amongst others - have tended to operate as singular and independent systems. The infrastructures of the twenty-first century must investigate relationships and transparencies - the pairing of infrastructure and architecture, information and movement. The project takes on political and physical resource flows, territory, new public and informative urbanisms, creating logical and informative architecture coupled with infrastructure. Making visible the infrastructure and creating a public dialogue this project creates a conceptually realistic proposal.

London UK is the urban testing grounds.

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[THIS IS THE PART WHERE YOU LEARN EVERYTHING]

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Timothy Gale
Fall 2010 SPRING 2011

liquidinfrastructure.info

Advisors:
Brendan Moran
Julia Czerniak

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Site: EU + London

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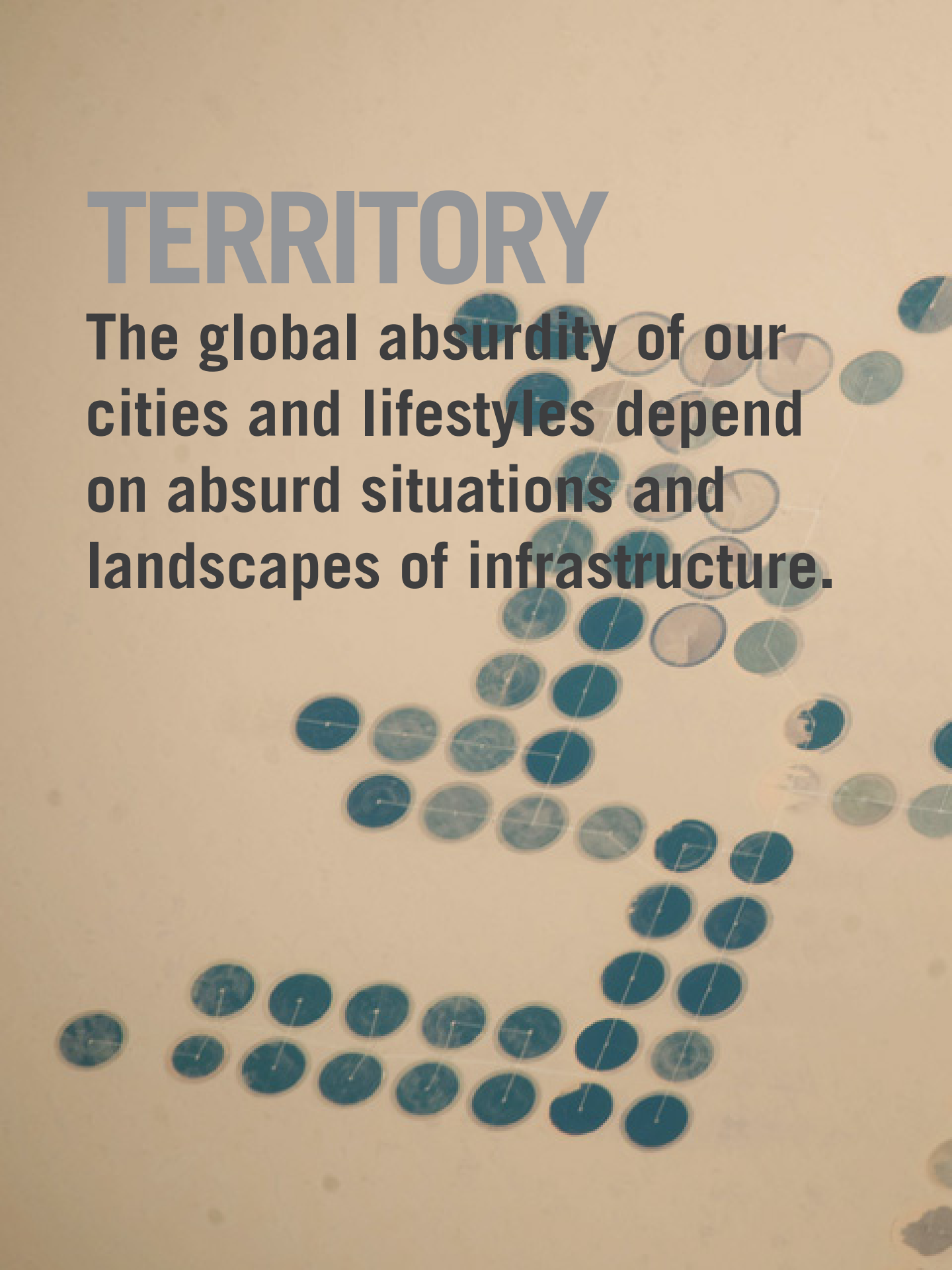
FLOWS
Water is not just a resource.
It is also a force of manipulation and control.

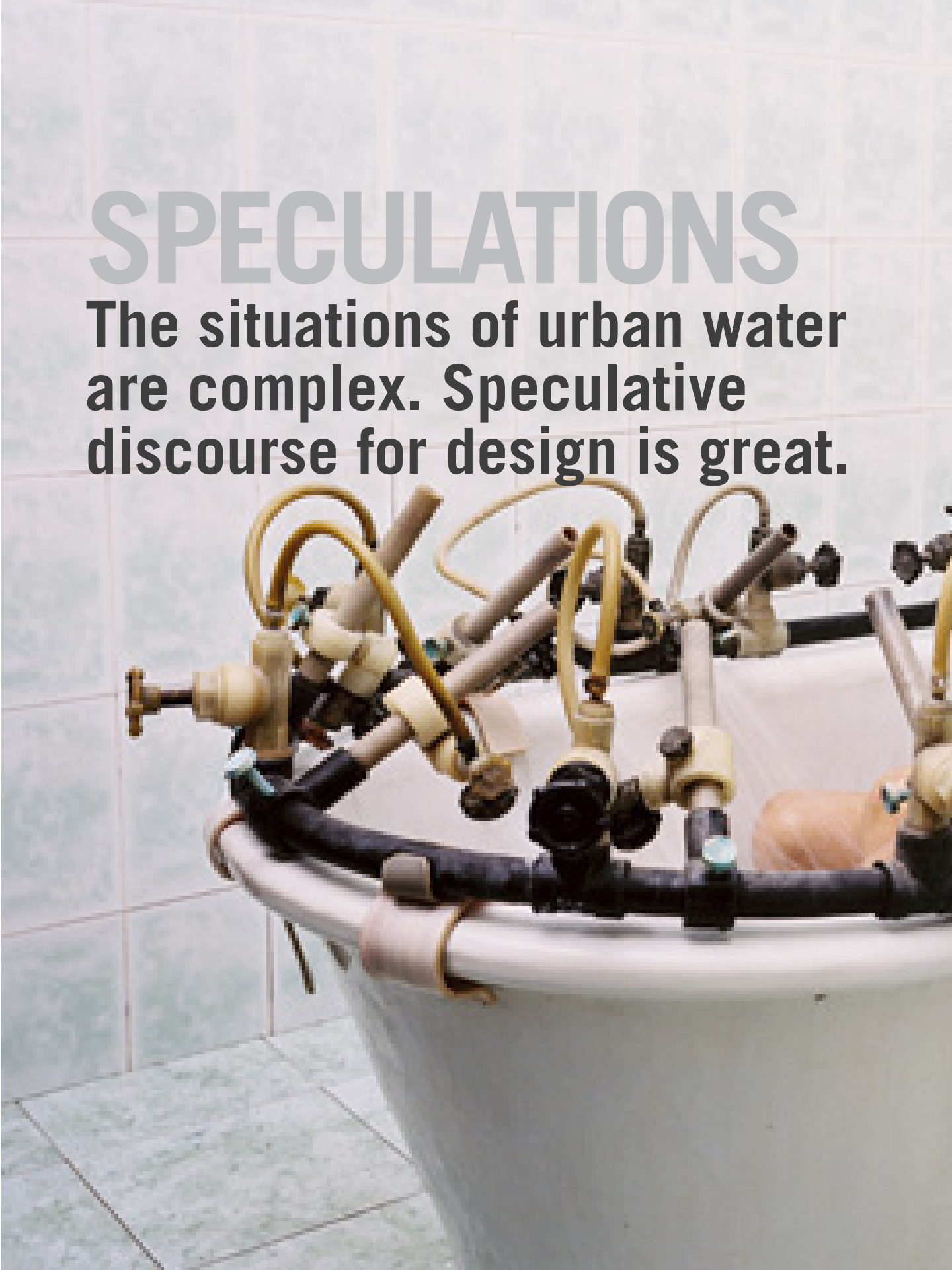
TERRITORY

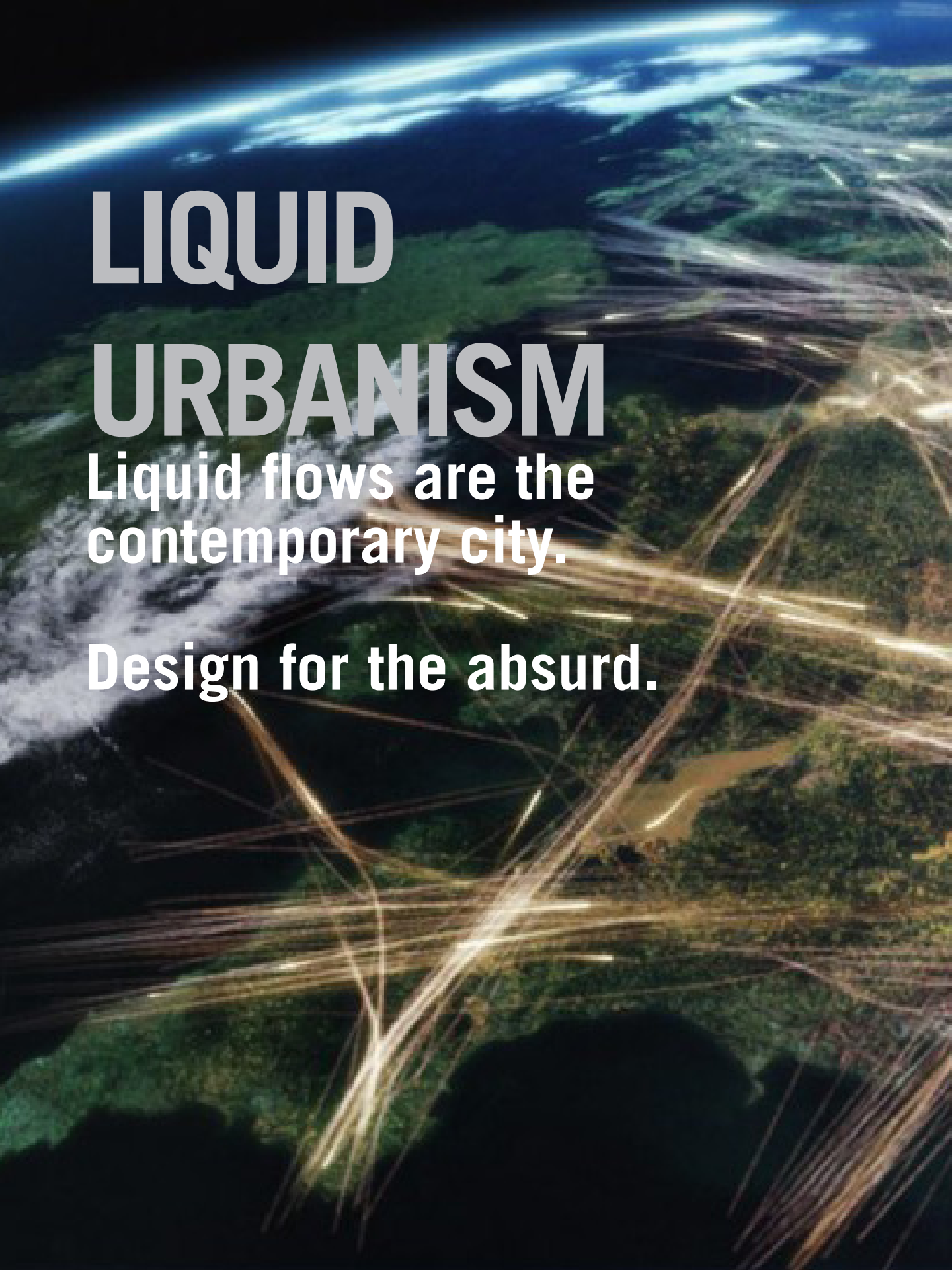
The global absurdity of our cities and lifestyles depend on absurd situations and landscapes of infrastructure.



SPECULATIONS

The situations of urban water are complex. Speculative discourse for design is great.




LIQUID
URBANISM
Liquid flows are the contemporary city.
Design for the absurd.

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TRANSNATIONAL SPACES OF WATER

"If politics means making decisions that divide, then nothing divides quite like the kilometres of concrete and steel that make up a freeway or rail line. By understanding infrastructure as the 'structuring of access' we foreground the way it unevenly redistributes opportunity (and cost) in accordance with power. As such it forms a crucible for political activity."
- *Kazys Varnelis*[1]

In a moment of urban transnational territorial expansion of London's fresh water supply importation from France, water is controlled as a political and physical commodity. As a response to the geopolitical issues of water importation into London UK, a new political entity emerges: the Think Tank. Through coupling political architecture and water infrastructure, the Think Tank legitimizes itself as a dominant institution for water governance. The project reveals the existing spatial subversion of Think Tanks and physical subversion of Pumping Stations to alter existing political structures by allowing the public to access the territorial.

It does not attempt to solve conflict or tensions, it instead seeks to utilize the architectural methods of coupling new programs and functions in the city to create a political and public paradigm of urban awareness. The project determines a logic which makes the invisible, visible through experience and visuality. Coupling a vertical pumping station with generic Think Tank office space, a new paradigm which discusses issues of territorial movement across scales, political and physical resource and infrastructural flows, rethinking the surface of the city as a responsive framework, and the visibility of information allowing people to access the complexities of our world. Manifesting the political and infrastructural issues of water importation and movement are paramount. The architect becomes a provocateur to generate this active space for dialogue.

Water issues are very relevant at all scales. Water rights and ownership are becoming contentious. Whether someone in Africa does not have access to clean water or another person in London accesses the cleanest fresh water from france unknowingly, there are political claims which manifest in physical conditions. With publically economically failing states turning to private shareholders, water infrastructure privatization in the late 1980's in the European Union created new geopolitical World Trade Organization agreements between countries and corporations influenced the management of design, urban services, and resource agreements. This privatization increased prices, reduced efficiencies, and took power away from governments

and people into the domain of the private corporation. The tensions between governments and corporations have increased in the last ten years with over 30 cities in the EU going through a ten year process to reverse these decisions. Once a government privatizes their water, the corporation owns the infrastructure and manages it, controlling the water flowing through it. Other cities such as London have had few water protests and infact have created the opposite affect, complete secrecy and obliviousness to issues. Tension is created by the marginalized urban citizenry which these two institutions serve. The government is at the mercy of the corporation. The Think Tank emerges.

It exists in a political delirium. Think Tanks are research institutions which promote political policy through their active engagement and research in a particular focus. The Think Tank provides a new Liquid Infrastructure for ideas, discussion and ultimately a moment for a new infrastructure for water governance. There are currently 18 major Think Tanks in London. None deal with need resource logics.

On my visit to London, I actively sought out the multiple politics involved: GLA [government], WaterUK [regulator], CIWEM [lobbyist], Thames Water [corporation]. Interested in the ability for design to connect multiple conversations, meetings with multiple people at each organization concluded the unclear and beauracratic management of water in London and the greater EU. The architect lying outside of the traditional discipline.

The Think Tank posits itself between the Greater London Authority [government] and Thames Water owned by RWE Largest transnational utility [corporation]. Thames Water originally began as Public Board which oversaw the pumping infrastructure of London. Maintaining a public image under the guise of RWE, few understood its radical shift in geography of power and control. The Think Tank's manifestation of power is symbolized through a commentary and critique of current systems, engulfing the City Hall as a symbol.

The politics of these water infrastructural flows becomes the site and subject, seeking to re-animate architectural discourse with urban relevance. It is the twenty-first century that will need to determine not only how to address ineffective infrastructures, but also new geopolitical and transnational situations and how to position new infrastructures and program that confront urgent issues of climate, sustenance, and politics. The opportunity for projecting a future infrastructure lies in bundling multiple processes with spatial experiences.

The physical infrastructures of the twentieth century - those of roads, rail, sewage, water, air, data, amongst others - have tended to operate as singular and independent systems. The infrastructures of the twenty-first century must investigate relationships and transparencies - the pairing of infrastructure and architecture, information and movement. The project takes on political and physical resource flows, territory, new public and informative urbanisms, creating logical and informative architecture coupled with infrastructure. Making visible the infrastructure and creating a public dialogue this project creates a conceptually realistic proposal.

1 Kazys Varnelis. "The Infrastructural City: Network Ecologies". Actar, 2008.

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WATER AS COMMODITY

Fact: the world has divided into rich and poor as at no time in our history. The richest two percent own more than half the household wealth in the world. The richest ten percent hold 85 percent of total global assets. And the bottom half of humanity owns less than one percent of the wealth in the world. The three richest men in the world have more money than the poorest forty-eight countries.
- *Maude Barlow*[1]

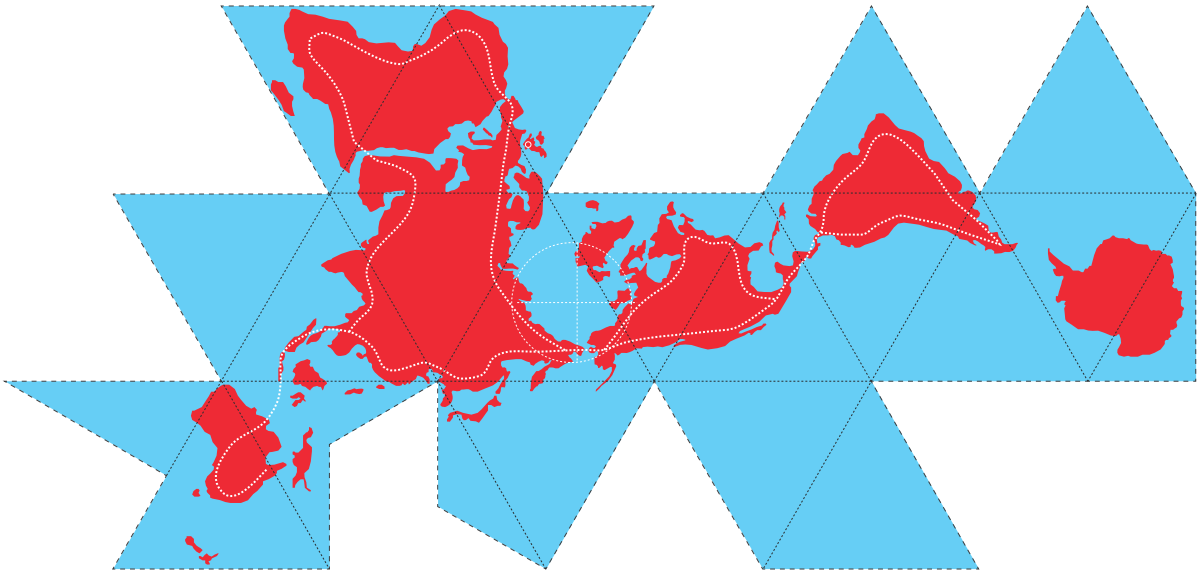
For historical reasons, three private companies grew up in France over the last century, operating water concessions for a number of local authorities. This happened nowhere else in the world, and these three French companies – Suez- Lyonnaise, Vivendi, and SAUR – were the only water companies in the world which were private, used to operating across a number of different public authorities, and with the size and capital resources to take advantage of the fashion for privatization which started in the 1990s.[2]

Today, about 5 percent of the world's water is in private hands.[3] The water sector thus has enormous potential for the few multinational corporations that dominate this market.

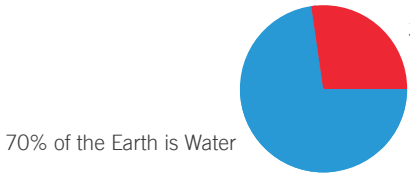
A report, Water Justice for All, released in March 2003 shows that water privatization has had negative impacts on communities in many countries and threatens to affect an increasing number of people. It reports global and local resistance to the control and commodification of water. Civil society demands that access to drinking water be recognized as a universal human right, in order to ensure that everyone can benefit from water resources. At the same time, it raises its voice against leaving water exploitation in the hands of private corporations whose only concern is making a profit from such services. Signed in Lisbon, Valencia (Spain) in 1998, the Water Manifesto is intended to demonstrate symbolically, politically and technically the urgent need for a 'water revolution'.

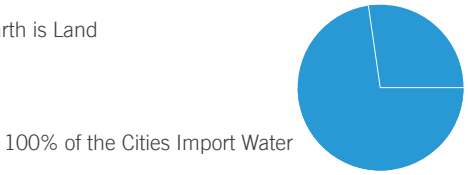
The globalizing effect and commodification of water is largely due to the spatial commodification of property and infrastructure. The way in which people understand water is inherently a commodification of substance and resource. Water is a human need and want. Thus everyone needs it, especially the difficulty of urban centres.

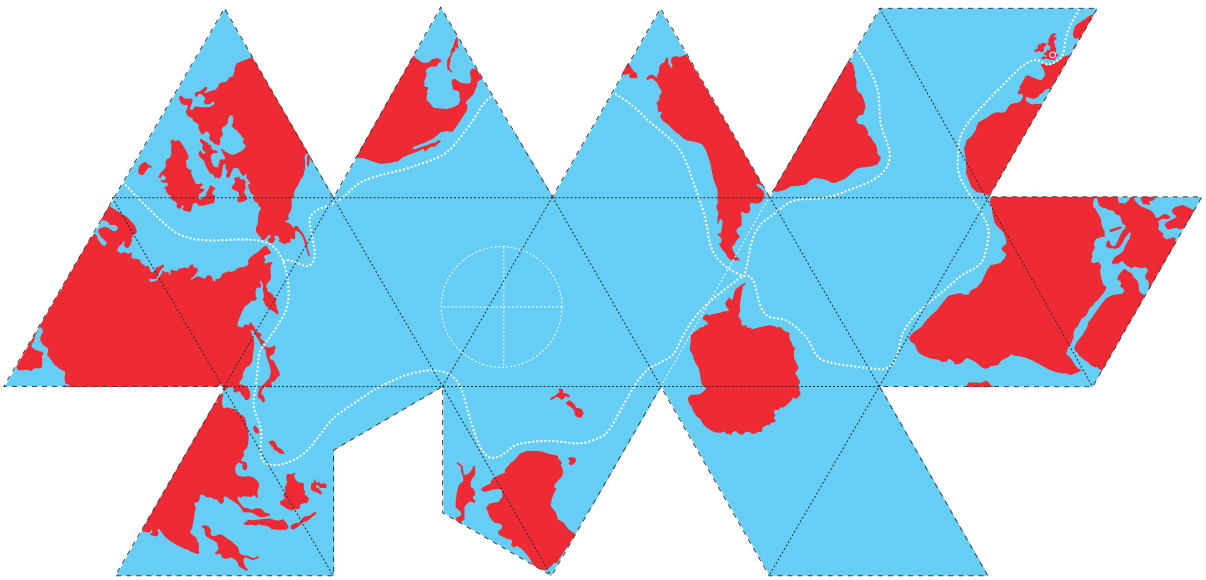
With the commodification of water infrastructure into private interest, water became an economic good, a commodity. In the past, governments unanimously believed access to basic



Redrawn Buckminster Fuller Map of Earth Land Network Connections







Redrawn Buckminster Fuller Map of Earth Water Network Connections. The 'water map' representation of the world demonstrates the connectivity of water based transit - the movement of resources. It also is a different way of viewing the networks - water based connectivity differs in spatial interpretation of flows. Vectors of connection demonstrate flows of proximity.

human services such as water, healthcare and education should not be included in trade agreements because these were essential components of citizenship. However, the World Trade Organization [WTO] and the General Agreement on Urban Services [GAUS] erodes these basic human rights.[4]

Globally, cities water supply systems operate in three systems of management. The first being a completely public system operated by public government agencies. The second system becomes a step between completely public governance to completely private governance. With the expansion of cities and industrial growth, cities sought to charter private government institutions to manage specific public functions of the urban water system. 'Private partnerships' were established the growth of Public-Private Partnerships [PPP's] in the delivery of essential services to urban residents which has been articulated as a form of decentralized service delivery that makes the water services more efficient and ultimately tries to bring governance structures closer to the people.1 The third and more recent phenomena is the complete privatization of water supply infrastructure which renders the governance of the system separate from the citizen and the urban municipality. These three systems of urban water governance are linear in their respective developments.

Currently due to the multiple systems of management and the development of how we consider water's role in the urban environment, water is being revalued and re-presented as a scarce economic good. With this shift, the triangular relationships between the external provider, the state and the citizen - the three critical agents in the delivery of water - spatially provide new forms of political action with the ascent of the neo-liberal paradigm. In this discussion the external provider is the private transnational consortia operating out of self interest and transcending governmental/ political boundaries of resource extraction and distribution.

When the corporation is given the leading role in fostering connection between the citizen instead of the government, to mode of interaction is one of 'customer management' in order to alleviate and resolve the economic constraints facing the state as well as educating users to appreciate water as a 'scarce ecological resource'. The relationship between town and nature - a key focus of political ecology - is significantly recast with the naturalization of scarcity and commodification of water. The outcome of this mode of governance when examined at a urban level deepens the struggle for 'access to water'. Urban political ecology can provide useful critical tools for rethinking processes surrounding the politics of distribution and production of water. In addition key questions about the socio-physical production of water as socio-nature are often ignored in distributional debates but become more evident in the critical political. The chapter examines the triangular relationship between the service user, provider and state is mediated, strategized and routinized.

The 21st century will be defined by our collectively growing need for water. Paradoxically, impending water shortages and crises are changing the rapid patterns of urbanization by requiring urban form to simultaneously adapt to water need and water defense. Increasingly required is elaborate infrastructures/systems to source, divert, collect and transport this liquid substance to our urban centres. How can the infrastructural complex integrate in accordance with the urban landscape to create a balance between infrastructure, social program, and ecological existence to develop a new productive urban paradigm in an increasingly de-public realm?

Cities relationship to water has existed since the urban form prevailed. Water is conceptualized in the human experience in cultural, societal, ritualistic, and need basis. New forms of water production are occurring due do increasing urban densities and geologically changing environments. Globalization and urban need have created prolific political situations between private corporations and pubic states which serve the urban citizenry. The combination of the existing and new infrastructures is creating new territories of water control and in turn producing new spatial relationships between these emerging/existing spaces of water.

"Total Design has two meanings: first, what might be called the implosion of design, the focusing of design inward on a single intense point; second, what might be called the explosion of design, the expansion of design out to touch every possible point in the world." - *Mark Wigley from "What Ever Happen to Total Design?"*

Resources are complex in relationship to human beings. Water is said to be the next oil. Water can not only be viewed as a resource and precious life force on our planet. It needs to be discussed in the context of a greater global complexity based on the political, social, economic, and situations of crises are constantly the multiple contingencies that direct and control how urban societies think and physically manifest their infrastructures. How, where, and why can architecture intervene in this complex system? It is the assertion of this document - it is imperative that architecture and the role of the designer not only understand the forces shaping this discourse, but to provide agency in highlighting issues. What design potentials exist, in this expanding liquid landscape?

The European Union present a clear example of water infrastructural management and ownership. The landscape of water that this project deals with is territorial - the XXL. Infrastructural management of water across continent, country and city boundaries is complex and not understood. The opportunity for design analysis, critique, connection and intervention to highlight the absurd flows of water informed by virtual/physical containment of the infrastructural and geopolitical. This allows for new pairings of program, infrastructure and resource.

1 Maude Barlow. Lecture at the G20 Summit 2009.

2 'Private Transnational Consortia' refers to conglomeration of five main Private Water Corporations: Suez, RWE, Vivendi, Veolia, and Bi Water. These corporations are own all of the worlds private water supply through subsidiary names. They act transnationally independent of national government resource regulations.

3 ibid.

4 Source: "The Services Council, its Committees and other subsidiary bodies". World Trade Organization. 2010.

5 Dean, M. "Governmentality: Power and Rule in Modern Society". London: Sage 2007. Print.

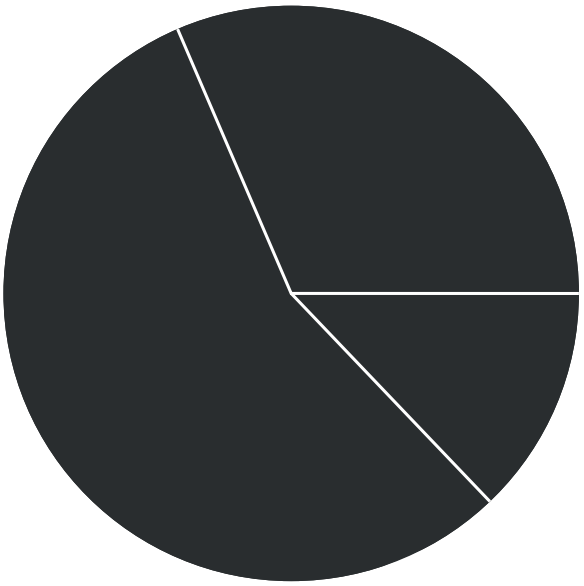
6 Starr, P. "The Meaning of Privatization". Yale Law and Policy Review, 6: 6-41, 1988 Print.

7 Pirie, M. "Privatization, Theory, Practice and Choice. Aldershot: Wildwood House". 1988. Print.

8 David Harvey. "Justice, Nature and the Geography of Difference". Oxford: Basil Blackwell, 1996. Print.

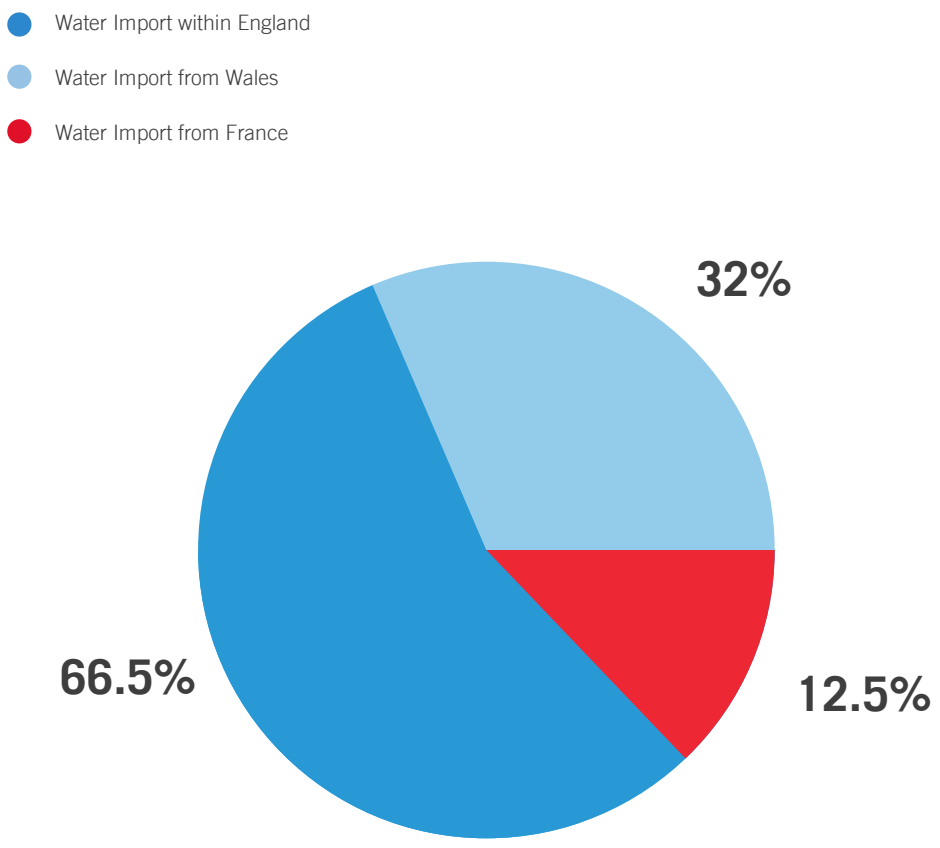
9 Eric Swyngedouw. "Power, Nature, and The City: The Cnquest of Water and the Political Ecology of Urbanization". Environmental Planning A, 29, 1997. Print.

Managed by a Transnational Corporation

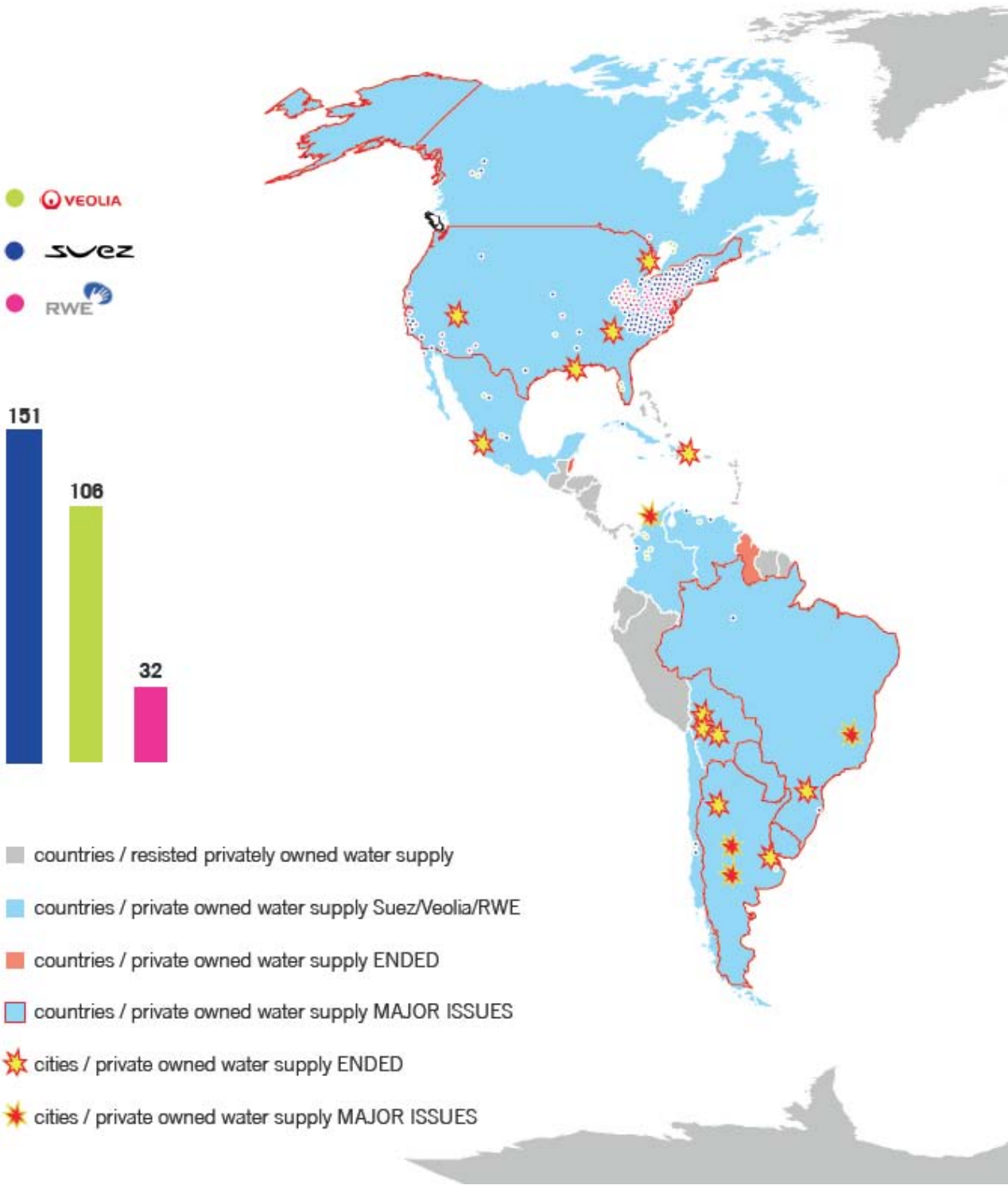


100%

Circular water retention fields in the desert. Egypt. NASA



Source: The 2010 Envoronmental Agency London Water Report


VEOLIA
suez
RWE
151
106
32
countries / resisted privately owned water supply
countries / private owned water supply Suez/Veolia/RWE
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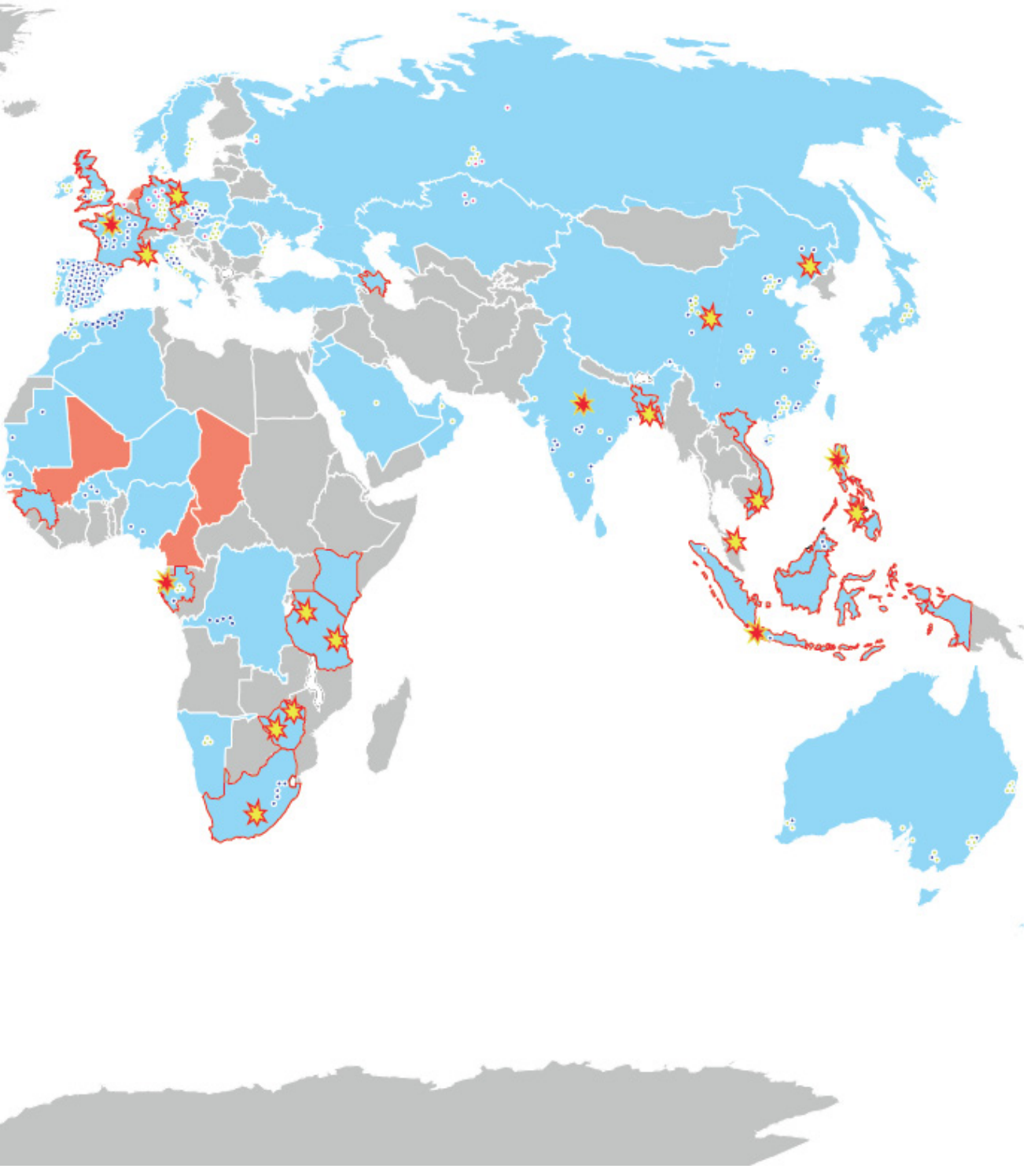
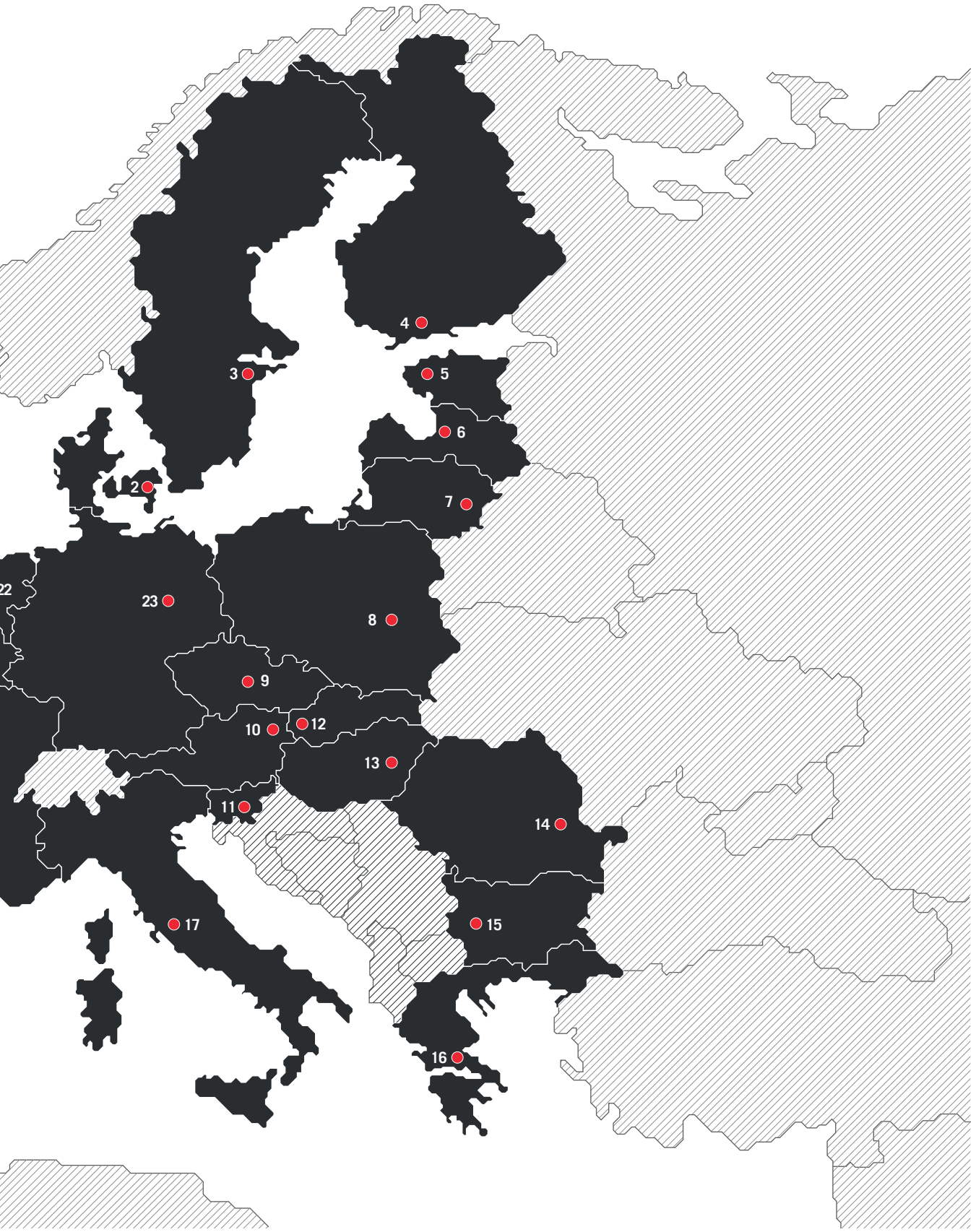


CONTEXT: EU

1 London [United Kingdom]
2 Copenhagen [Denmark]
3 Stockholm [Sweden]
4 Helsinki [Finland]
5 Tallinn [Estonia]
6 Riga [Latvia]
7 Vilnius [Lithuania]
8 Warsaw [Poland]
9 Prague [Czech Republic]
10 Vienna [Austria]
11 Ljubljana [Slovenia]
12 Bratislava [Slovakia]
13 Budapest [Hungary]
14 Bucharest [Romania]
15 Sofia [Bulgaria]
16 ATHENS [Greece]
17 Rome [Italy]
18 Madrid [Spain]
19 Lisbon [Portugal]
20 Paris [France]
21 Brussels [Belgium]
22 Amsterdam [Netherlands]
23 Berlin [Germany]

● CAPITAL CITIES IN EU COUNTRIES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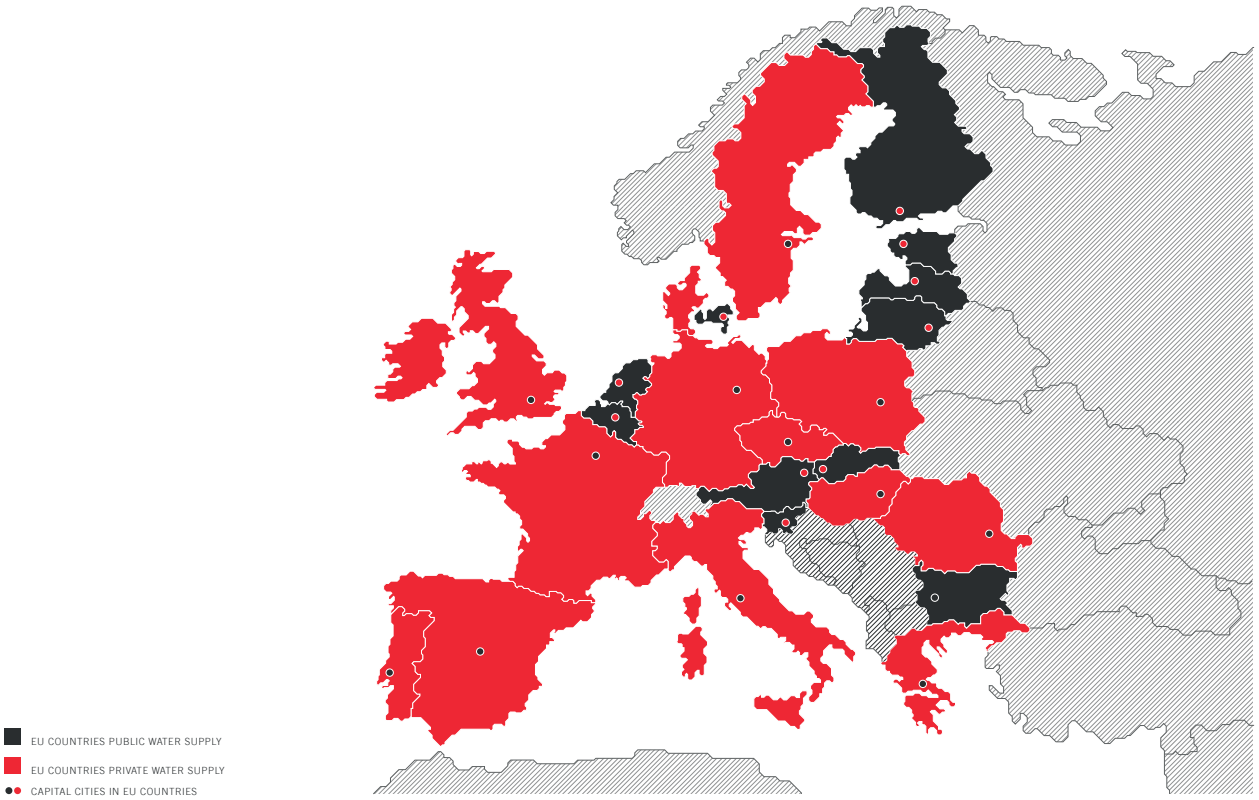
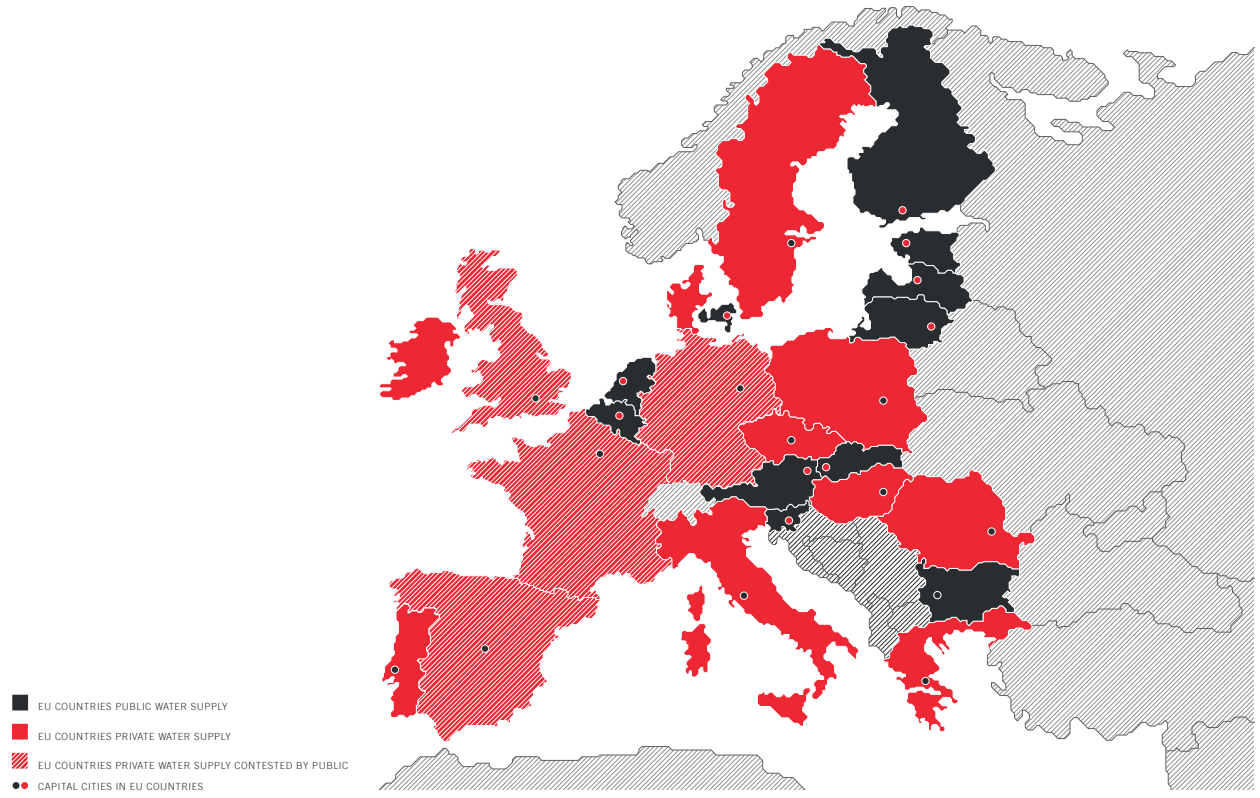
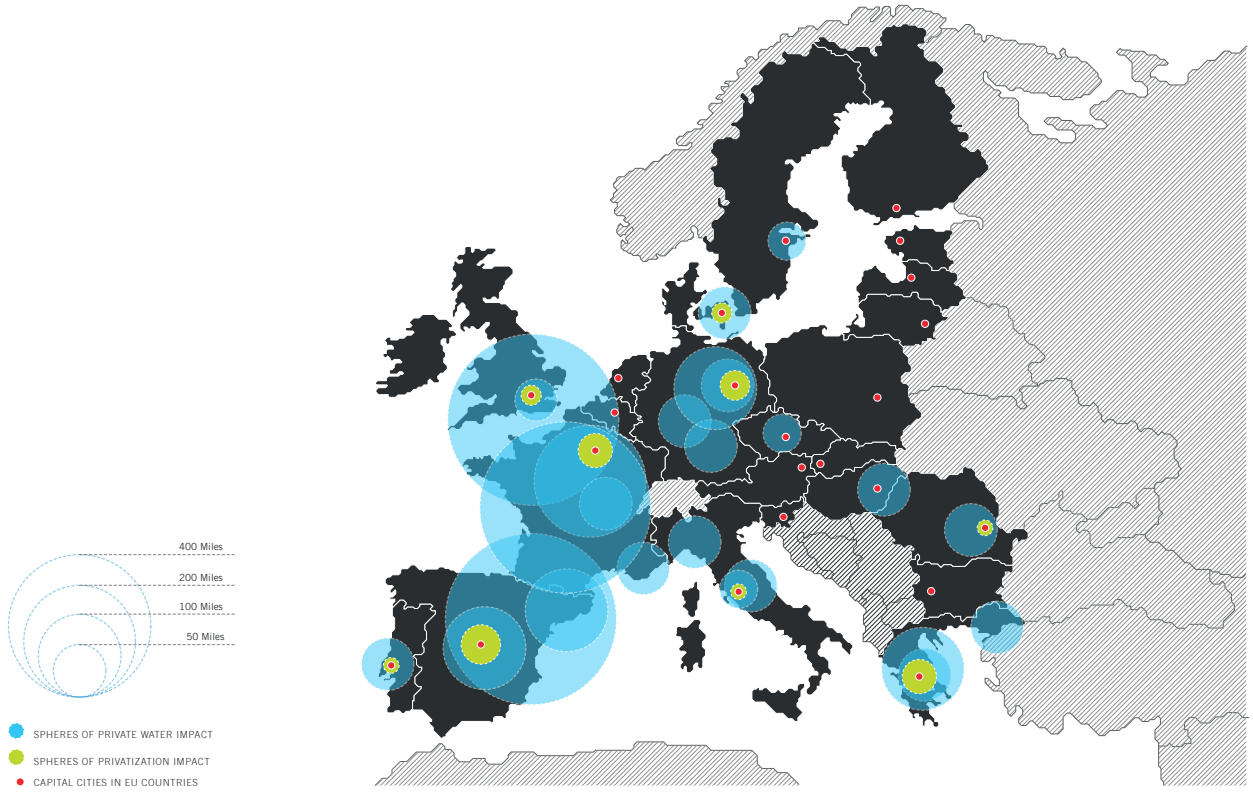

EU COUNTRIES PUBLIC WATER SUPPLY
EU COUNTRIES PRIVATE WATER SUPPLY
CAPITAL CITIES IN EU COUNTRIES


EU COUNTRIES PUBLIC WATER SUPPLY
EU COUNTRIES PRIVATE WATER SUPPLY
EU COUNTRIES PRIVATE WATER SUPPLY CONTESTED BY PUBLIC
CAPITAL CITIES IN EU COUNTRIES

The EU is a Nation State. The nation state is a state that self-identifies as deriving its political legitimacy from serving as a sovereign entity for a country as a sovereign territorial unit. The state is a geopolitical entity. The nation is a cultural entity. The EU operates through a hybrid system of supranational independent institutions and intergovernmentally made decisions negotiated by the member states. Because of this arrangement and scale proximity of the countries politics, resources, infrastructure, economics directly effect each regions based on other regions.

Over 75% of EU countries have privatized water infrastructure by transnational corporations. Under the World Trade Organization Agreement on Urban Services, cities with privatized urban services/ infrastructure or water supply infrastructure control is dictated by the owning corporation. Due to the privatization and the ability for trans-national consortia to operate resources independent of government boundary. This is the new territory of urban water. Water from France imported to London completely bypass's the French government. The corporations owns the spring, the corporation exports the water.

The most contested cases of anti-water privatization have occurred in four countries; Germany, France, Spain and England. Just a year ago Paris went through a long twentyyear de privatization process. The public demanded to take back their urban infrastructure. Recently cities such as Madrid and Barcelona have experienced droughts and needed to further privatize in order to provide adequate urban water infrastructures.



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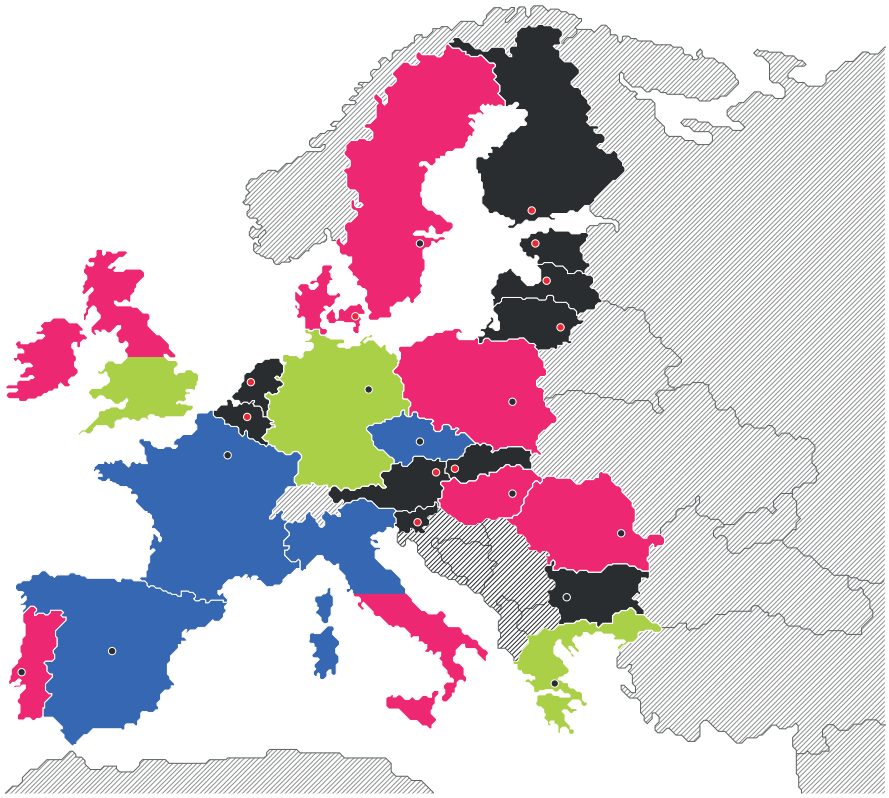
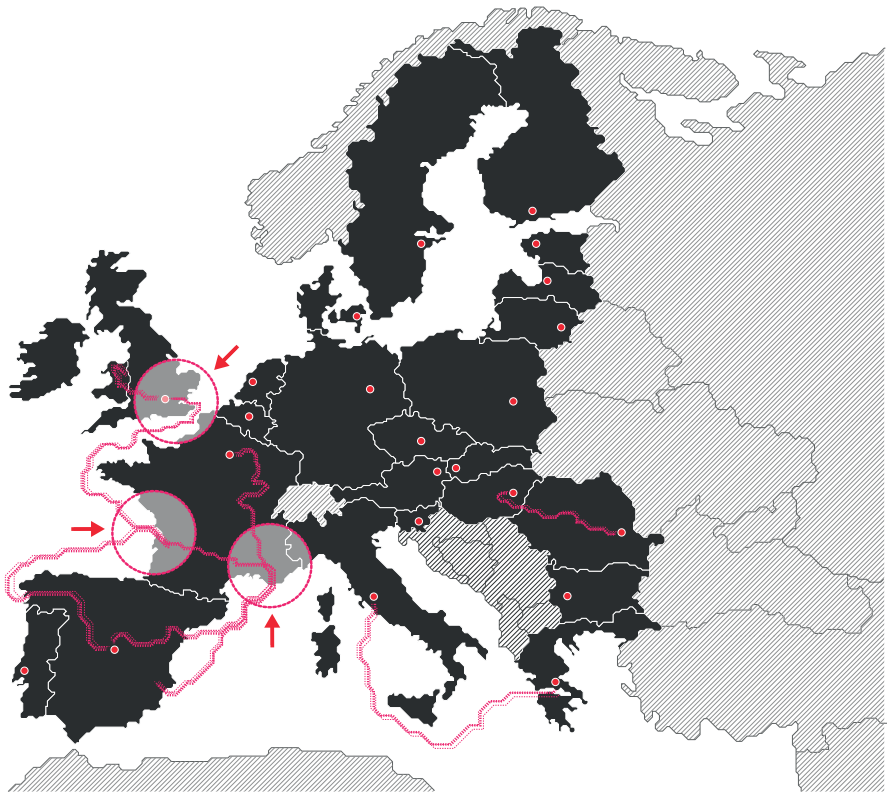
The territory of water infrastructure also opens an expanded political repertoire. The most powerful players [governments/corporations] have the capacity to make water infrastructures, but equally important these infrastructures can escape nominative designations or documented events. As an action, it can remain undeclared and discrepant, and as a medium, it can determine what survives. The indeterminate space of water infrastructural flows can offer insight into understandings of how water, politics, and sociality can reprogram workings of our current society.



RWE
VEOLIA
SUEZ
CAPITAL CITIES IN EU COUNTRIES



MAJOR TRASNNATIONAL INFRASTRUCTURE FLOWS
CAPITAL CITIES IN EU COUNTRIES

WALES
ENGLAND
LONDON
FRANCE
PARIS
EXTRACTION
STORAGE
INTERSTITIAL SPACE
TRANSNATIONAL MIXING SPACE
INTERSTITIAL SPACE
EXTRACTION
GEOPOLITICS
WATER
STORAGE

LONDON WATER SOURCE GEOGRAPHY

RWE

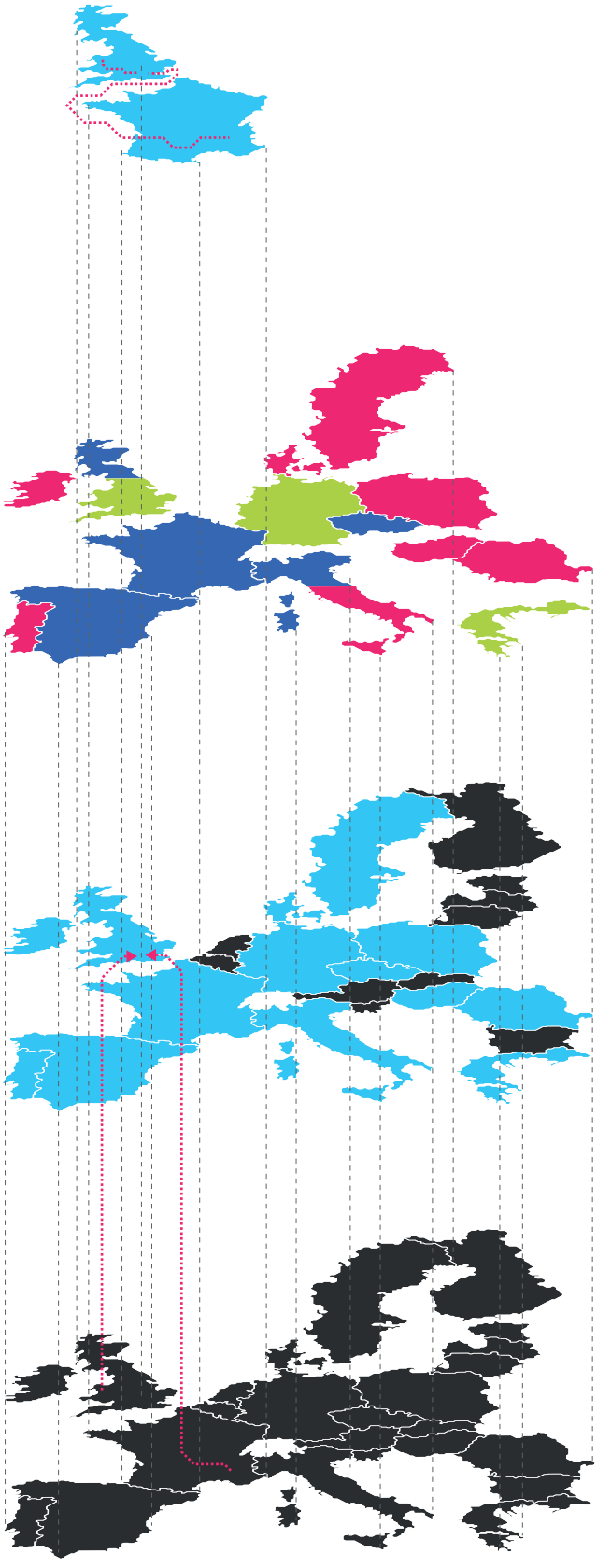
VEOLIA

SUEZ

EU COUNTRIES PRIVATE WATER

EU COUNTRIES PUBLIC WATER

EU COUNTRIES



NETWORK
INFRASTRUCTURAL SYSTEM

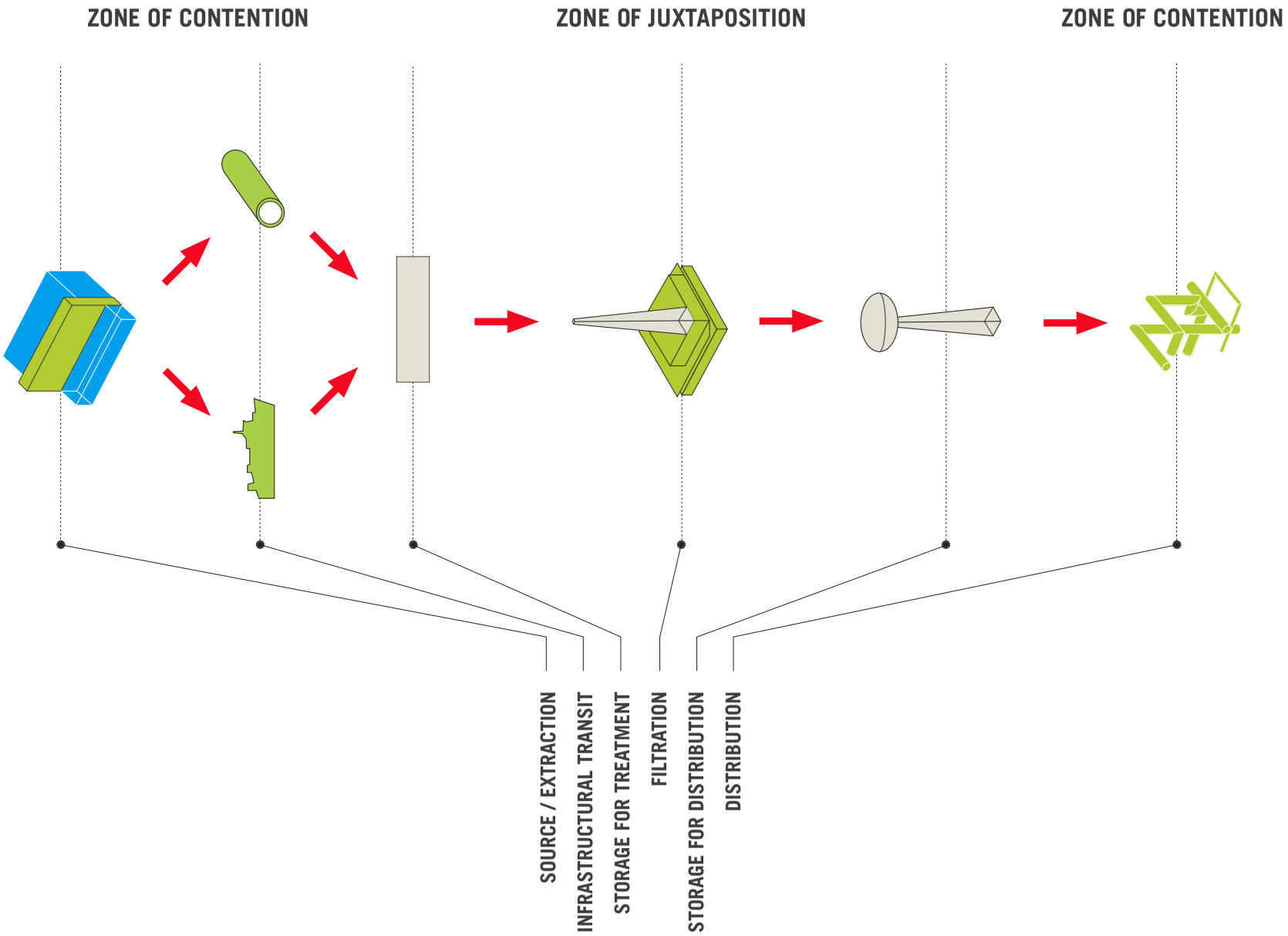
"If we term everything Infrastructure, then we have defined infrastructure as nothing ... This raises the question as to what isn't infrastructure. The answer to this would be to say that the property of something being infrastructural or not, does not properly belong to the object itself, it emerges through the relation said object has with other objects. If this relationship is a dependent one, in which one object relies on the other for its functioning, then we might say that the second object plays the role of infrastructure. However if the relation between the objects is characterized by autonomy – that is to say independence – then we could not say that the object operates infrastructurally."
- Adrian Lahoud

The infrastructural space of water in this project situates itself in the context of extraction or sourcing, the flow of transit [pipeline/tanker] and then the storage of water for distribution into complex connective system of taps and faucets.

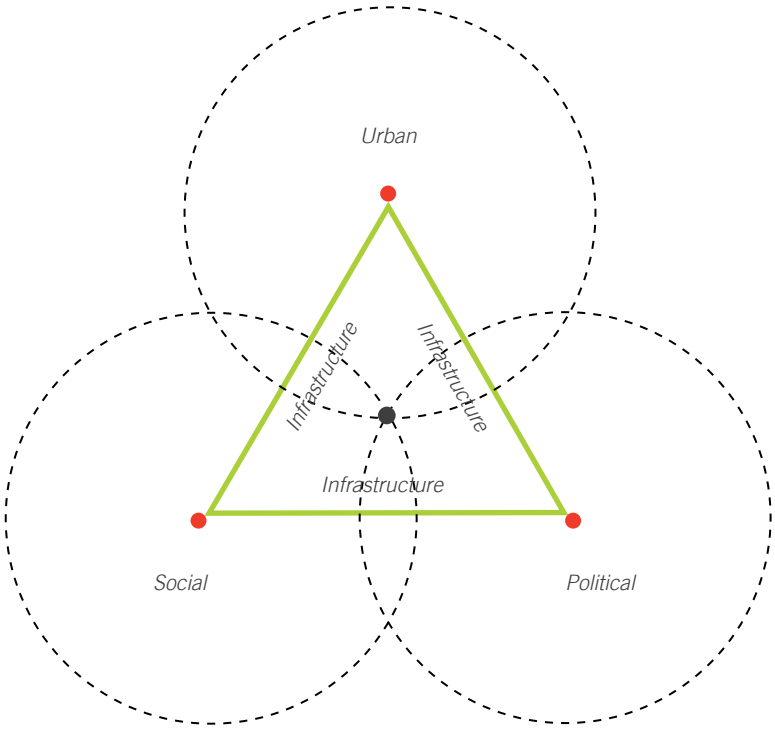
London grew tremendously in the hundred years between 1860 and 1960, and infrastructure was the foundation for that growth. Trains, streetcar lines, streets and highways allowed inhabitants to rush around with relative ease. As infrastructure filled past capacity and congestion became bad, the public had faith that the experts would solve the problems by constructing new infrastructure - always more capacious and more technologically advanced. But ofcourse, this is not true.

Water Infrastructure was idealized by modernist architects. Take Vers une Architecture, for example, in which Corbusier extolled the societal transformations that would take place if only the people were to listen to the architect and the engineer. It was, after all, a matter of architecture or revolution. For modernists, a plan and the capacity of a clear idea would bring order to the chaos of the metropolis. In implementing the plan, modern architecture relied on infrastructure above all else.

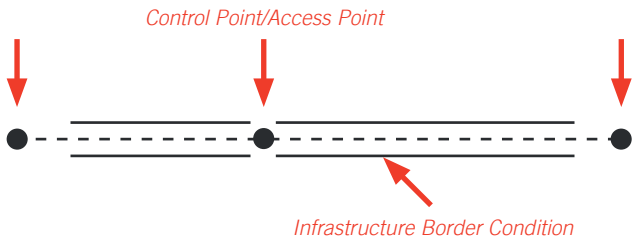
A city's modernity became nearly equivalent to its infrastructure, as evident in Haussmann's reconstruction of Paris, the ultra-real technological landscapes of Tony Garnier's Cite Industrielle, or the wild, electric fantasies of Antonio Sant'Elia's Citta Nuova. Modern architecture would be nothing but pastiche without engineering to support it - merely new clothes for an old body. The engineer, Le Corbusier concluded, 'puts us in accord with natural law.' Only after the engineer laid down a foundation could the architect start to create beauty through form. The space of water is infrastructural. The infrastructural space of water vast - designed as spaces for commodity - not spaces for the human.


ZONE OF CONTENTION
ZONE OF JUXTAPOSITION
ZONE OF CONTENTION
SOURCE / EXTRACTION
INFRASTRUCTURAL TRANSIT
STORAGE FOR TREATMENT
FILTRATION
STORAGE FOR DISTRIBUTION
DISTRIBUTION

London Beckton Water Filtration Treatment Plant. The largest facility in the EU. The security is as high as a maximum security prison. Water is unloaded from France/Wales and England. This is a transnational space of water. A private infrastructural enclave mixing water from multiple geographic locations



London Beckton Water Filtration Treatment Plant. The largest facility in the EU. The security is as high as a maximum security prison. Water is unloaded from France/Wales and England. This is a transnational space of water. A private infrastructural enclave with

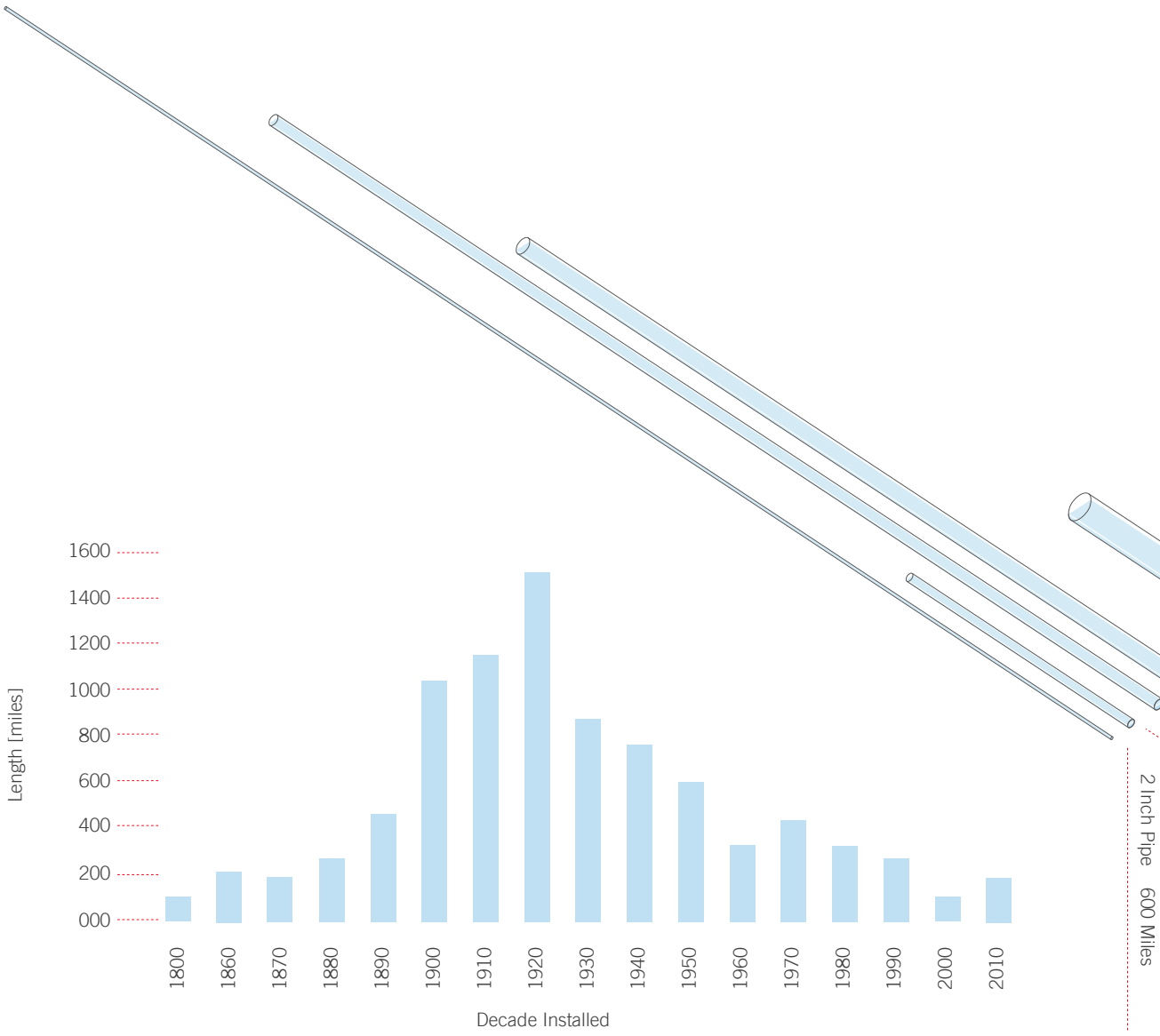


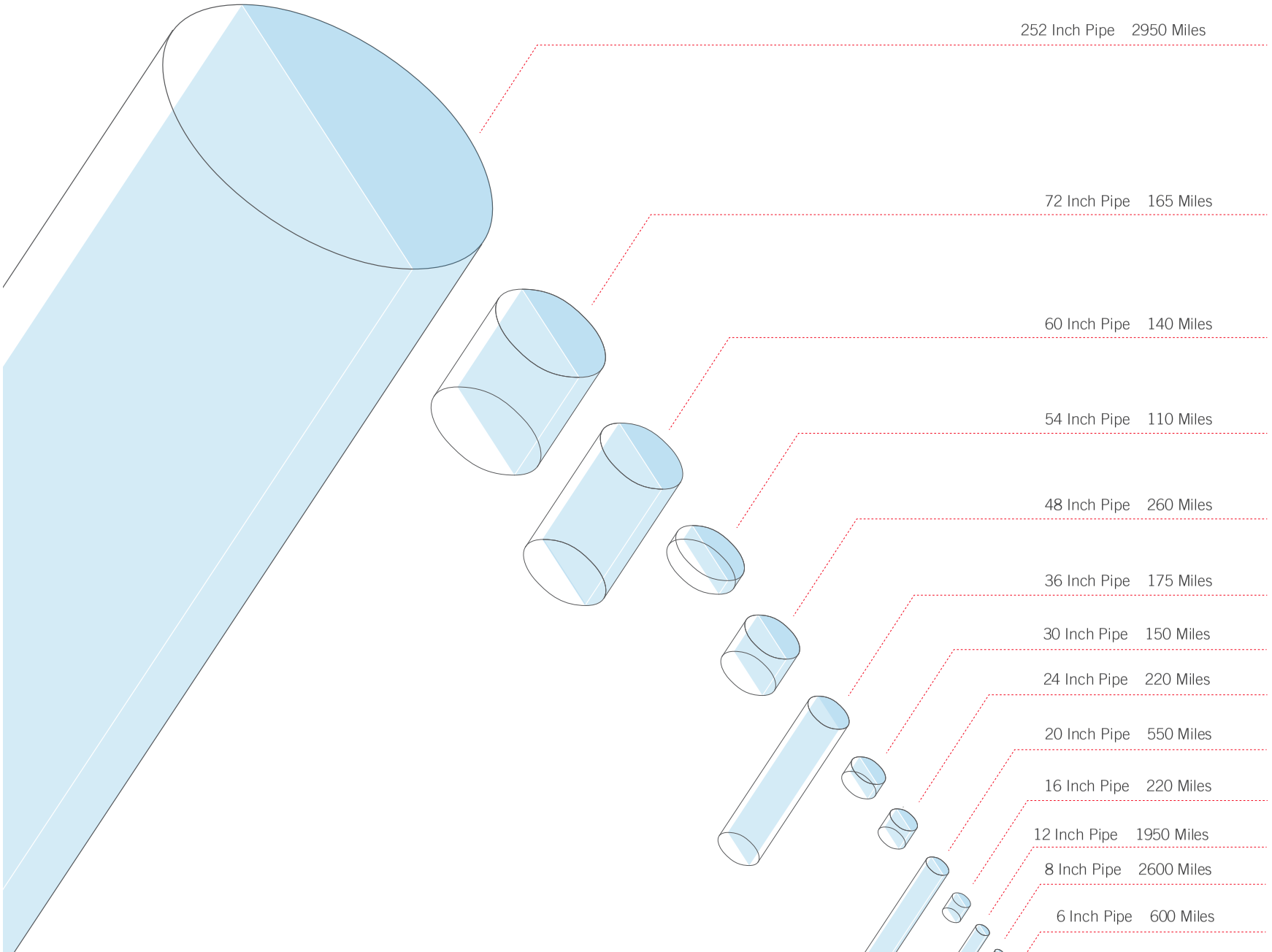
Curiously, infrastructure is a new word. The Oxford English Dictionary identifies its first use in 1927. The word only achieves real currency in the 1980s after the publication of a scathing public policy assessment entitled America in Ruins: The Decaying Infrastructure, which raised many of the issues raised here. To understand the technical systems that support a society - roads, bridges, water supply, wastewater, flood management, telecommunications, gas and electric lines - as one category, it was first necessary to see it fail.is inherently architectural and design based. These should be the new issues of the architect in the urban environment, as these are the design questions that are emerging currently.

Although infrastructure has the inherent ability to understand itself as a continuous global complex and unchanging in physical disposition based on place, the typologies within the system change varying on environmental, social, and political conditions. These conditions stipulate how the water is transported, where the water and infrastructure need to be spatially placed in relation to source and urban area, and the differing policies which regulate the cleansing of water differently throughout the globe.

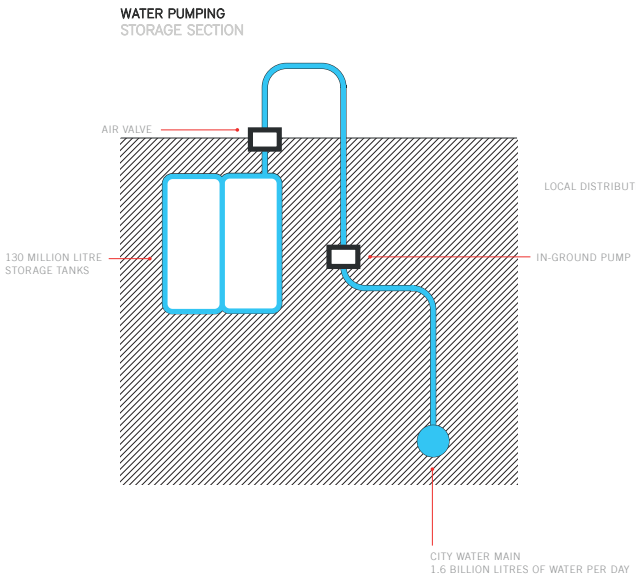
Water importation and filtration facility. Germany.

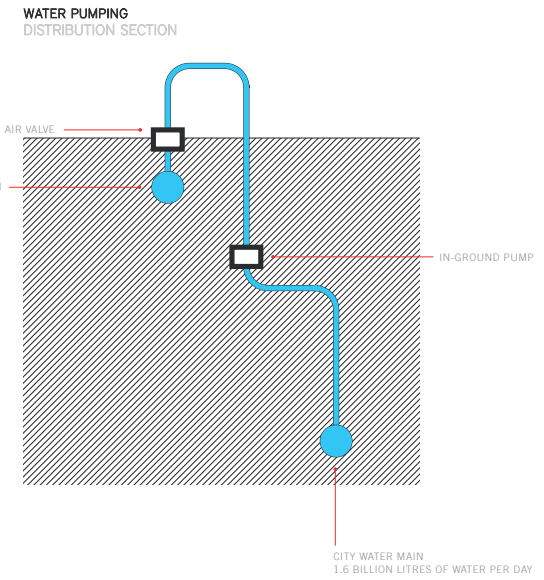
London's Piping System

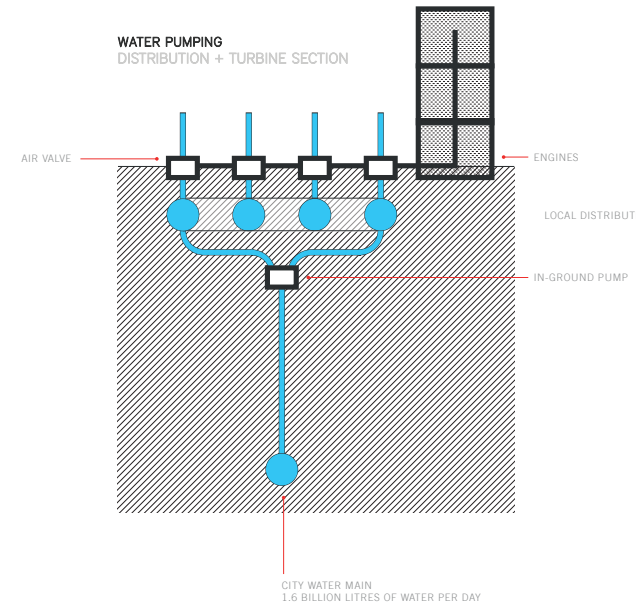


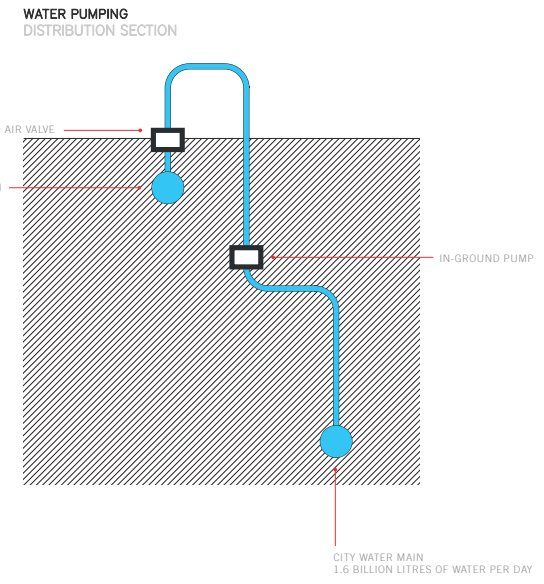

252 Inch Pipe 2950 Miles
72 Inch Pipe 165 Miles
60 Inch Pipe 140 Miles
54 Inch Pipe 110 Miles
48 Inch Pipe 260 Miles
36 Inch Pipe 175 Miles
30 Inch Pipe 150 Miles
24 Inch Pipe 220 Miles
20 Inch Pipe 550 Miles
16 Inch Pipe 220 Miles
12 Inch Pipe 1950 Miles
8 Inch Pipe 2600 Miles
6 Inch Pipe 600 Miles

Pumping Station

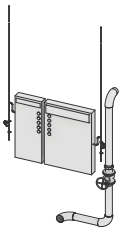




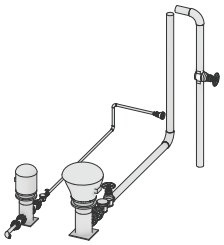




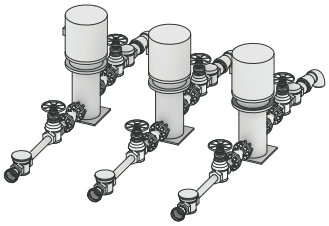
INFRASTRUCTURAL COMPONENTS



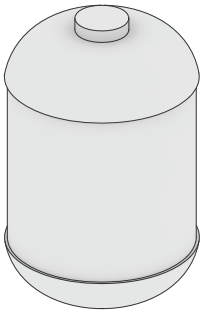
CONTROL ROOM VALVE OPERATION



IN-GROUND PUMP



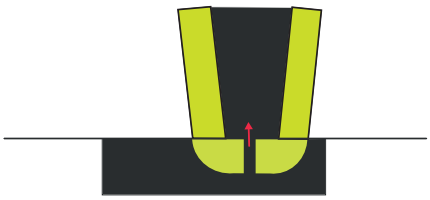
WATER PUMPS + AIR VALVE INJECTION



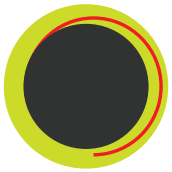
WATER STORAGE TANK

BUILDING INFRUSTRUCTURAL PLACEMENT

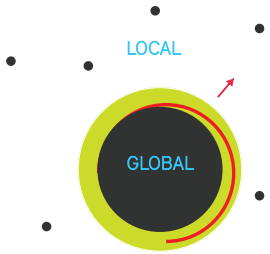
SECTION



PLAN



LOCAL



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Transnational Spaces of Water

2
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Water as Commodity

Hydropolitical Morphology

Infrastructural System

3
TERRITORY

Politics: Corporation + State + Citizenry

Space: Human + Water

Site: EU + London

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Glossary

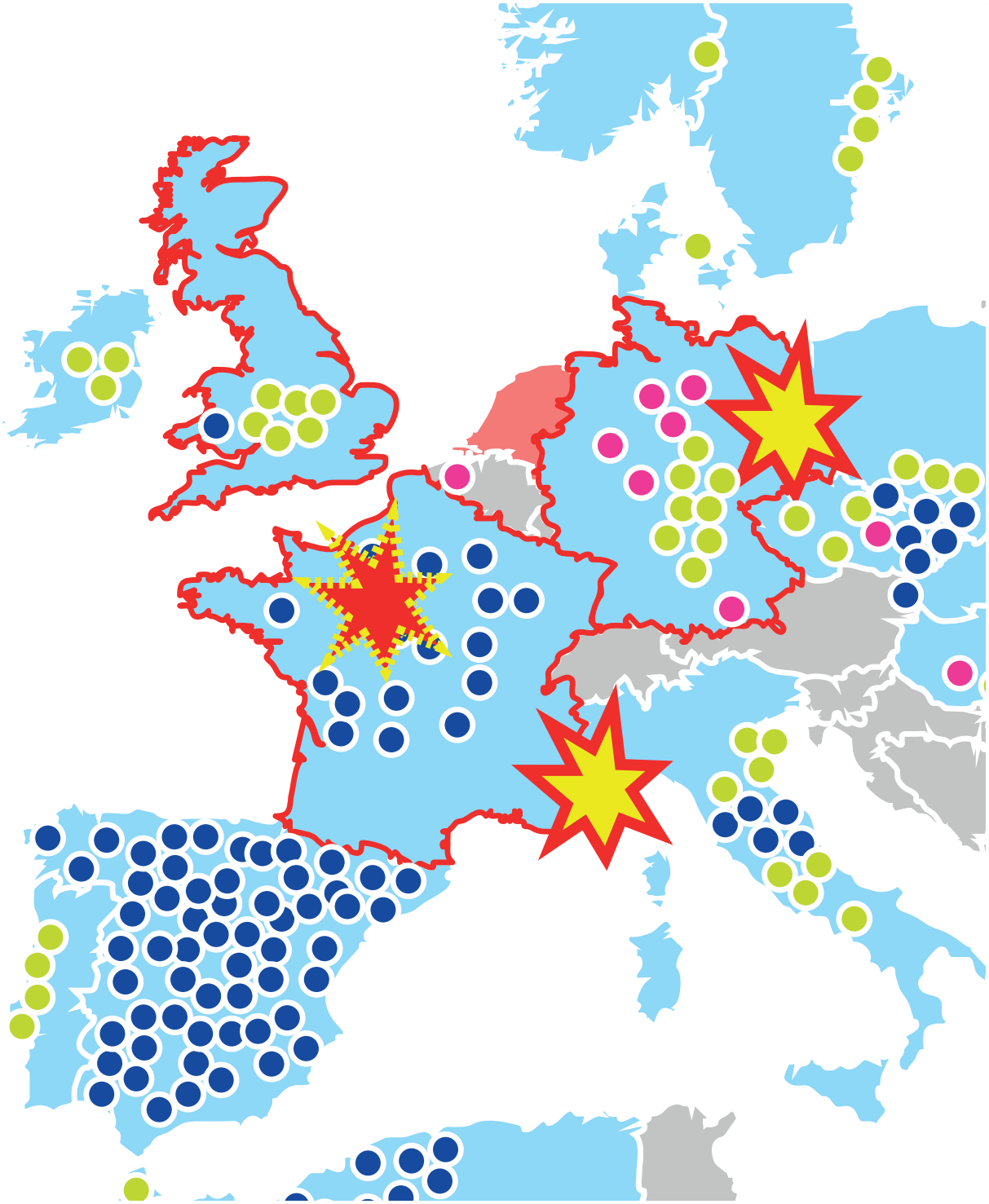
TERRITORY

POLITICS: CORPORATION + STATE + CITIZENRY

"The object of art - like every other product - creates a public which is sensitive to art and enjoys beauty. Production thus not only creates an object for the subject, but also a subject for the object." - Karl Marx

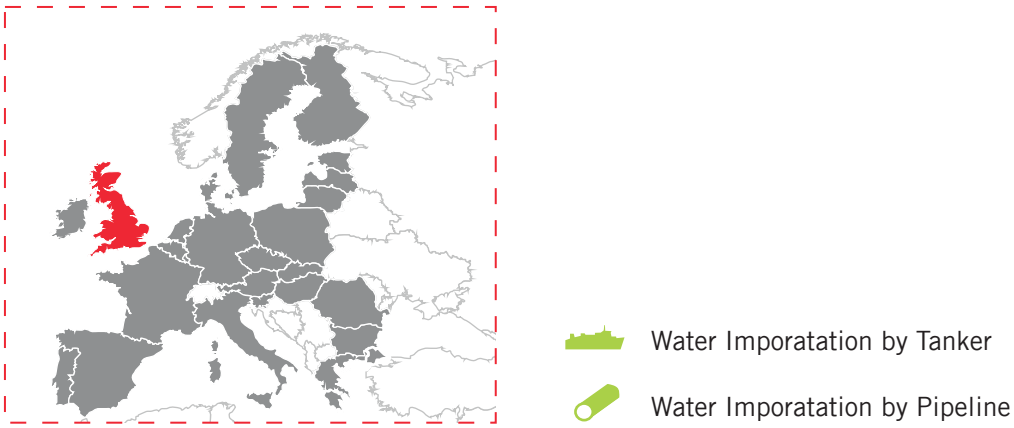
"I find it more interesting to understadn the city no longer as tissue, but more as mere coexistence, a series of relationships between objects that are almost never articulated in visual or formal ways, no longer 'caught' in architectural connections." - Rem Koolhass

The surveillance of public behaviour in readying for March against Private Services; London 2008.

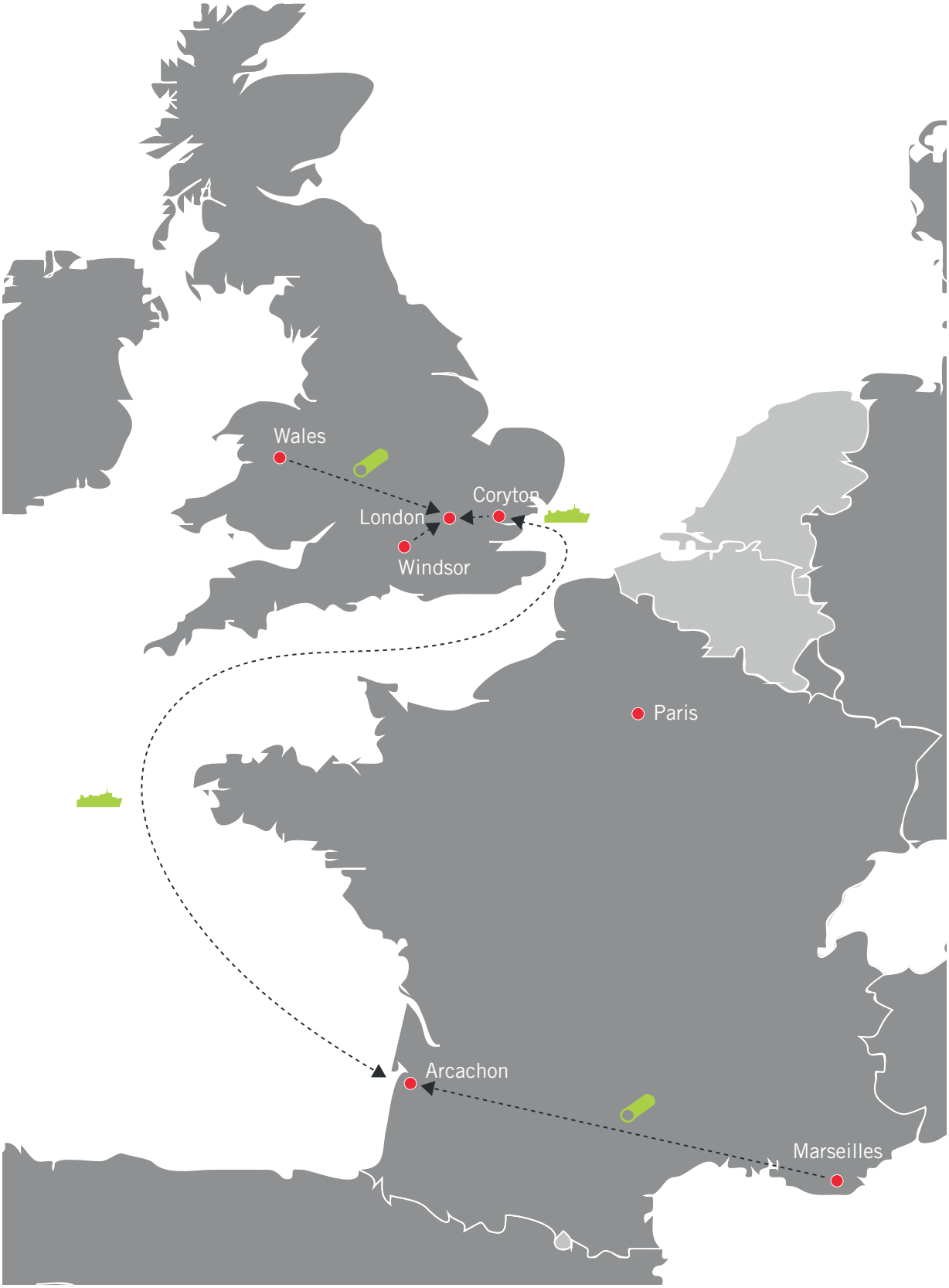

countries / private owned water supply MAJOR ISSUES
countries / resisted privately owned water supply
cities / private owned water supply ENDED
countries / private owned water supply Suez/Veolia/RWE
cities / private owned water supply MAJOR ISSUES
countries / private owned water supply ENDED

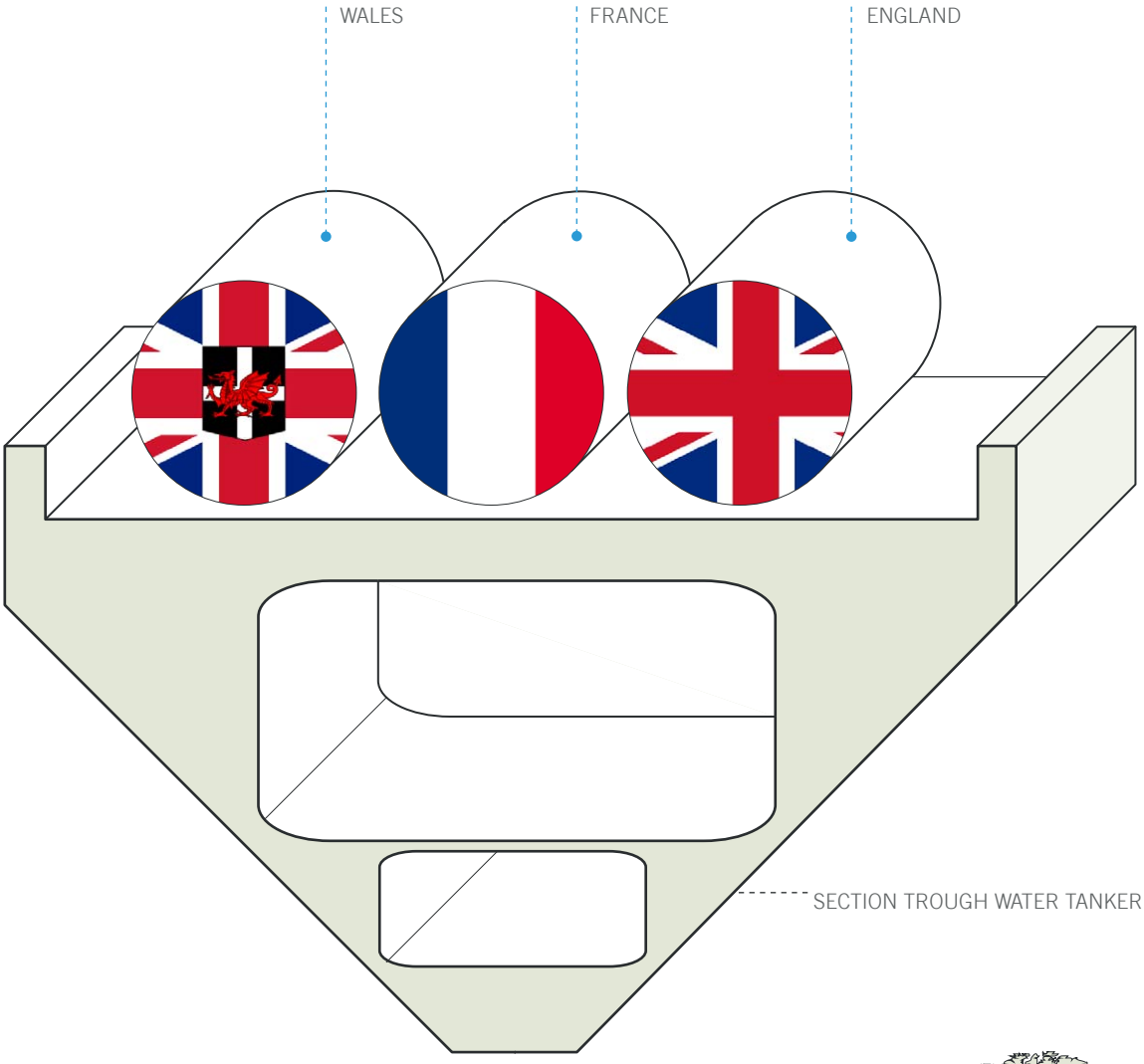
London is simultaneously a city facing crisis due to continual growth of urban existence without recognition of the ecologically changing environment and contains strong political denial towards the social infrastructure of the city at various scales. Using London one can begin to understanding the conflicting impacts of human occupation and the situations sought to be subverted. Intertwining social and infrastructural functions would reveal invisible processes into the public realm and ability to humanize the lifeblood of our urban existences.

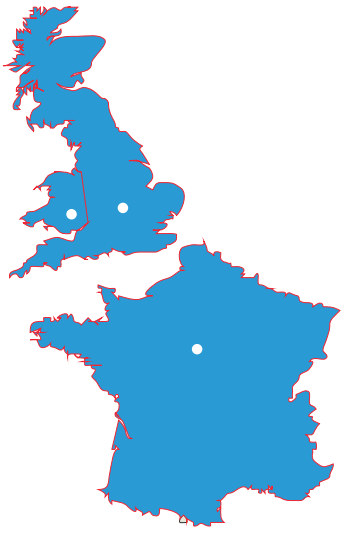
The ironicism of London's water supply is evident. Firstly, due to de-industrialization in London the city has to pump out 60 million gallons of 'grey water' a day to keep the city form flooding. Secondly due to the local geological composition, water does not filtrate far into the ground, thus a high water table. Thirdly, imported water come from three locations geographically, Wales, France and the Thames Estuary. The fascinating juxtaposition in this situation is that water come from these places due to the private corporations who own the aquifers subjected to transnational law, and upon arrival in London's outer filtration plants the water is subjected to local law.



Importation happens by two means - taker ship and pipeline. The complexities of hydrospatiality are exemplified in this situation of convergence.


Wales
Coryton
London
Windsor
Paris
Arcachon
Marseilles

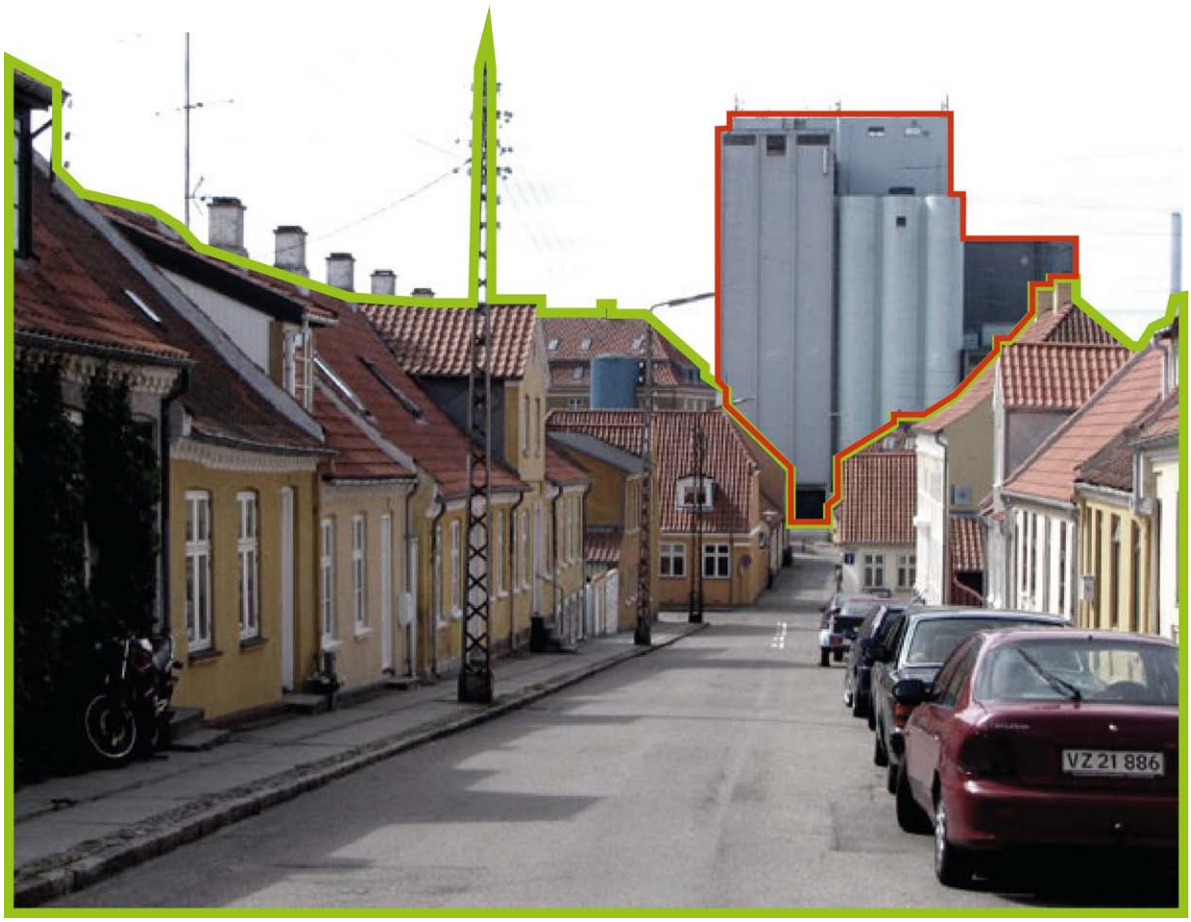

WALES
FRANCE
ENGLAND
SECTION TROUGH WATER TANKER

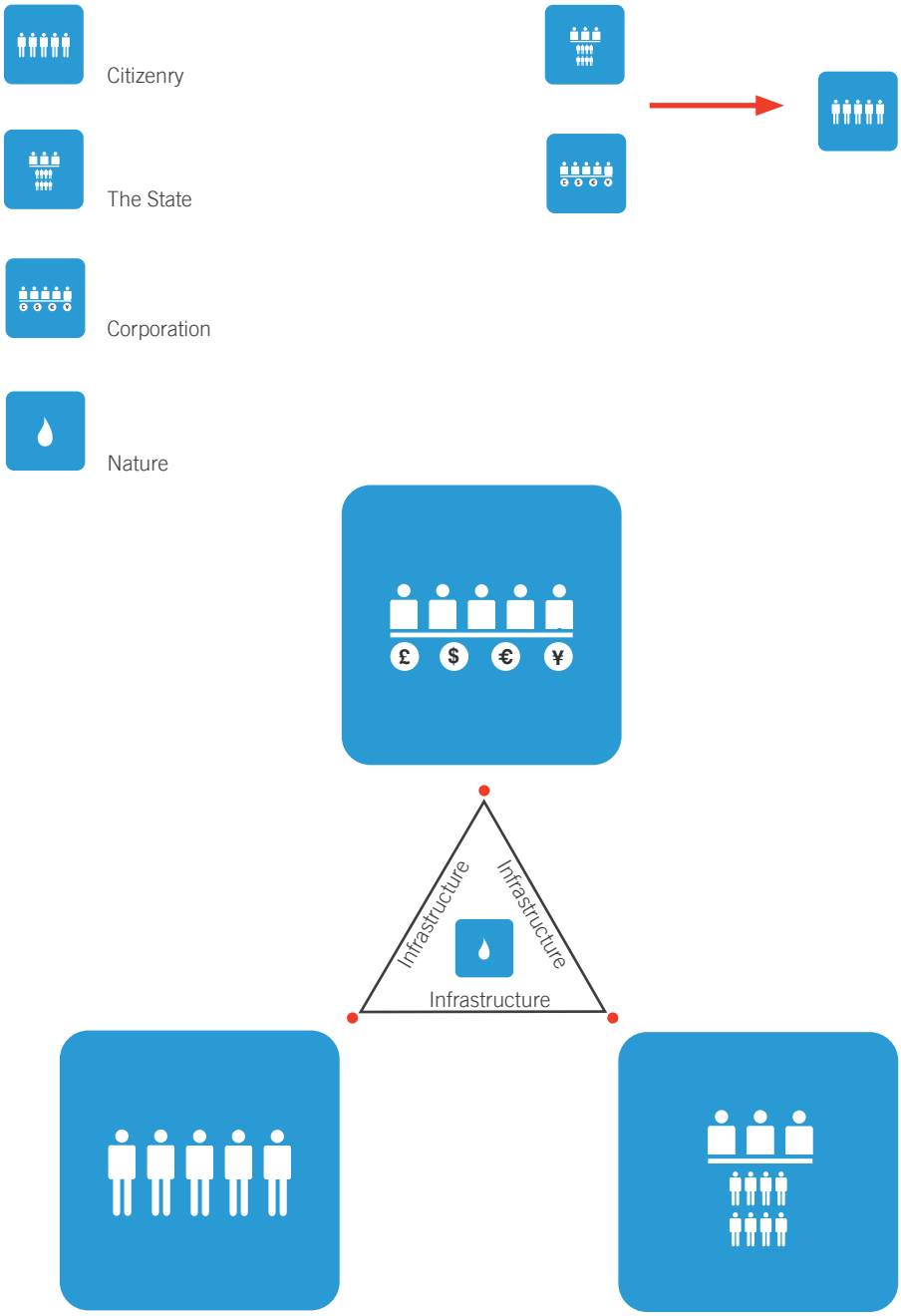


LANDSCAPE OF PRODUCTION

URBAN LANDSCAPE
[SOCIAL/ECOLOGICAL/VIRTUAL]

LANDSCAPE OF CONSUMPTION





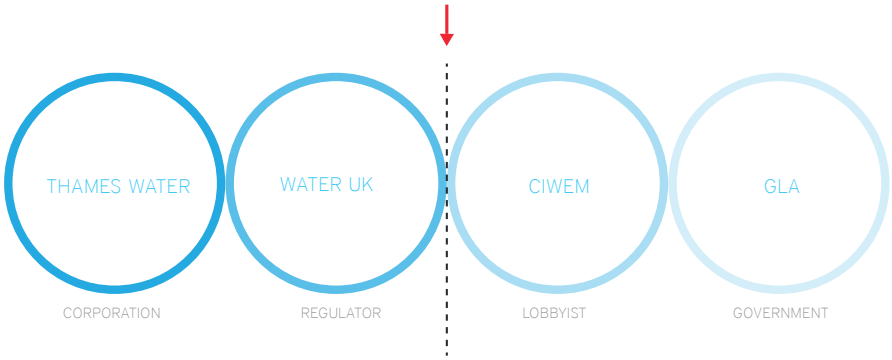
Water Infrastructure is the lens through which to understand the political, social and urban - the physical territories created by geopolitical powers between private and public constituencies. The territory of water infrastructure is a complex power play of the political. Nature, The State, Corporation and The Citizen are four entities which influence transnational water flow.

These icon symbol representations follow the structure of the book as understanding which of these bodies is functioning in the creation of the image, diagram, concept and territory.

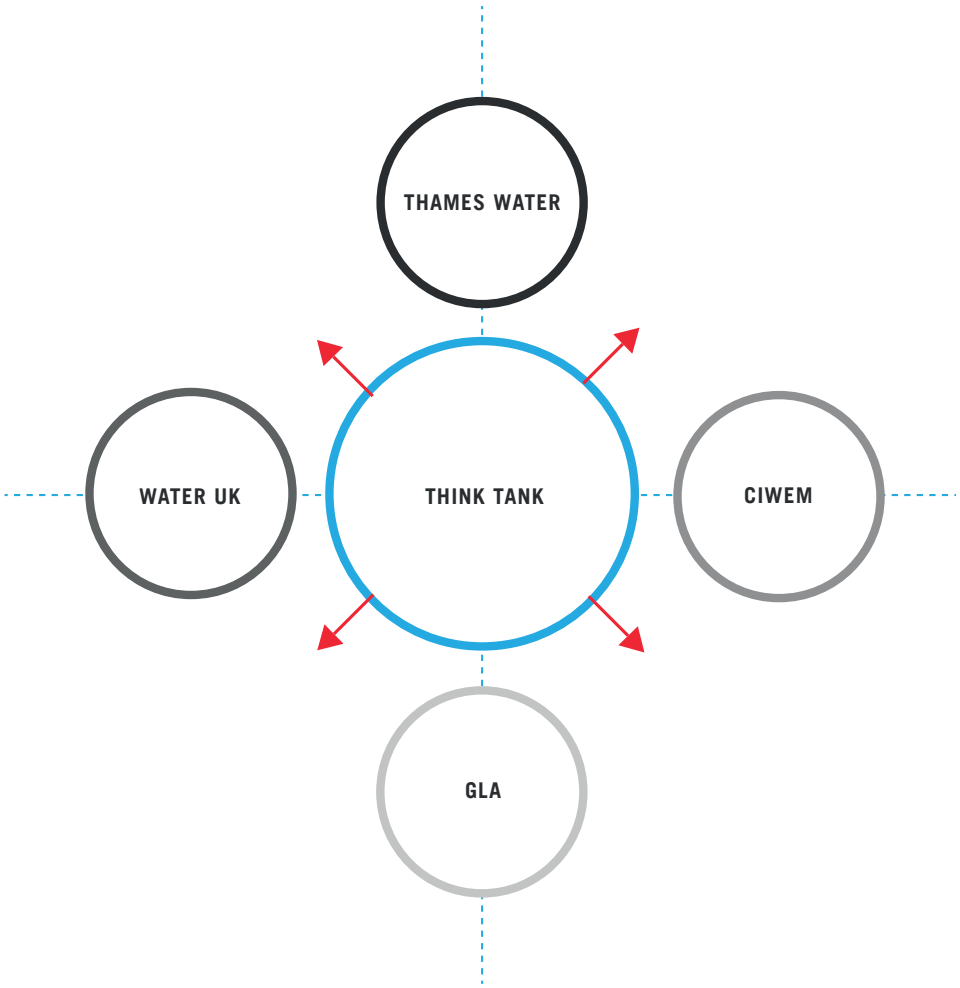
1 'Private Transnational Consortia' refers to conglomeration of five main Private Water Corporations: Suez, RWE, Vivendi, Veolia, and BiWater. These corporations are own all of the worlds private water supply through subsidary names. They act transnationally independent of national government resource regulations.

2 Source: "The Services Council, its Committees and other subsidiary bodies". World Trade Organization. 2010.

EXISTING POLITICAL WATER GOVERNANCE

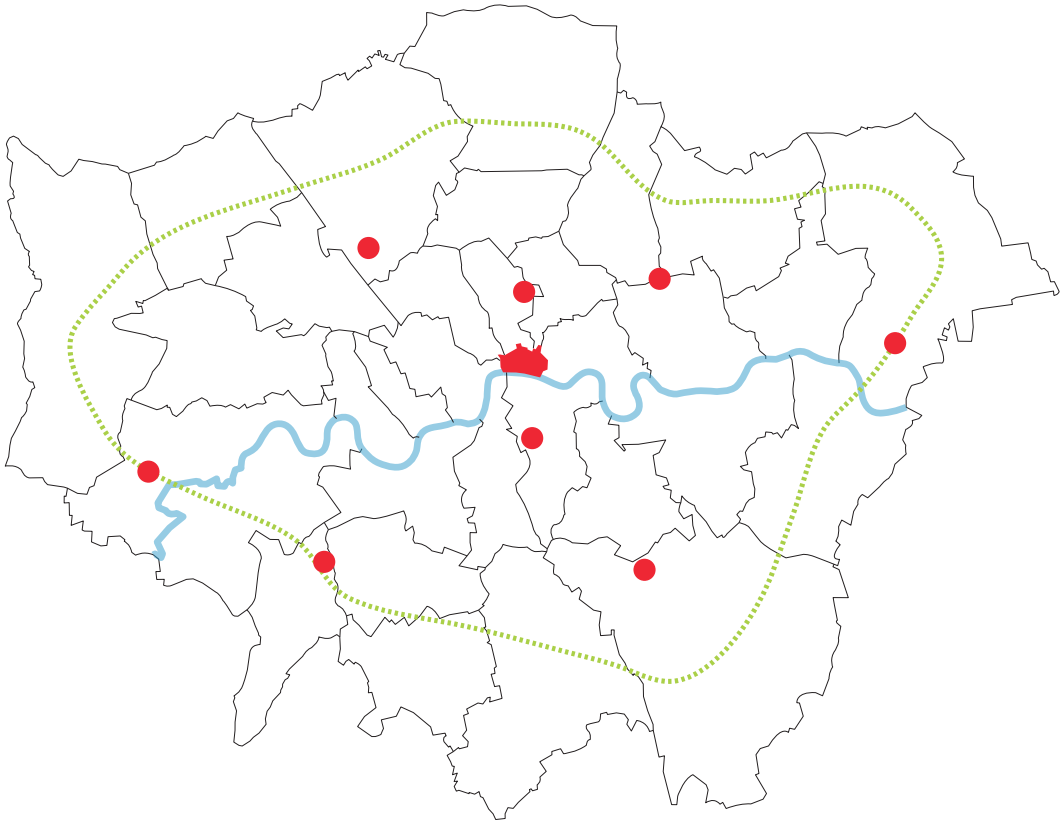


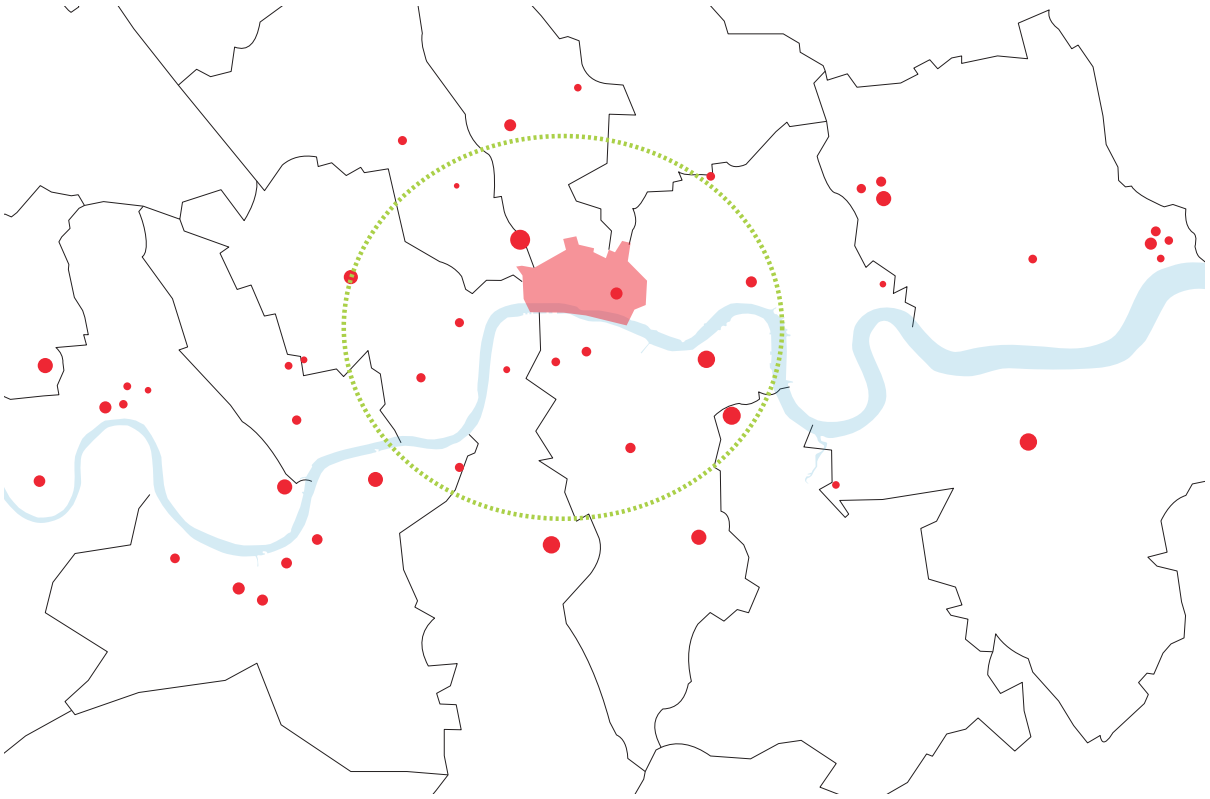
NEW POLITICAL WATER GOVERNANCE



TERRITORY
SITE

Construction of Pumping Station





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Glossary

In a moment of urban transnational territorial expansion of London's fresh water supply importation from France, water is controlled as a political and physical commodity. As a response to the geopolitical issues of water importation into London UK, a new political entity emerges: the Think Tank. Through coupling political architecture and water infrastructure, the Think Tank legitimizes itself as a dominant institution for water governance. The project reveals the existing spatial subversion of Think Tanks and physical subversion of Pumping Stations to alter existing political structures by allowing the public to access the territorial.

It does not attempt to solve conflict or tensions, it instead seeks to utilize the architectural methods of coupling new programs and functions in the city to create a political and public paradigm of urban awareness. The project determines a logic which makes the invisible, visible through experience and visuality. Coupling a vertical pumping station with generic Think Tank office space, a new paradigm which discusses issues of territorial movement across scales, political and physical resource and infrastructural flows, rethinking the surface of the city as a responsive framework, and the visibility of information allowing people to access the complexities of our world. Manifesting the political and infrastructural issues of water importation and movement are paramount. The architect becomes a provocateur to generate this active space for dialogue.

Water issues are very relevant at all scales. Water rights and ownership are becoming contentious. Whether someone in Africa does not have access to clean water or another person in London accesses the cleanest fresh water from france unknowingly, there are political claims which manifest in physical conditions. With publically economically failing states turning to private shareholders, water infrastructure privatization in the late 1980's in the European Union created new geopolitical World Trade Organization agreements between countries and corporations influenced the management of design, urban services, and resource agreements. This privatization increased prices, reduced efficiencies, and took power away from governments and people into the domain of the private corporation. The tensions between governments and corporations have increased in the last ten years with over 30 cities in the EU going through a ten year process to reverse these decisions. Once a government privatizes their water, the corporation owns the infrastructure and manages it, controlling the water flowing through it. Other cities such as London have had few water protests and infact have created the opposite affect, complete secrecy and obliviousness to issues. Tension is created by the marginalized urban citizenry which these two institutions serve. The government is at the mercy of the corporation. The Think Tank emerges.

It exists in a political delirium. Think Tanks are research institutions which promote political policy through their active engagement and research in a particular focus. The Think Tank provides a new Liquid Infrastructure for ideas, discussion and ultimately a moment for a new infrastructure for water governance. There are currently 18 major Think Tanks in London. None deal with need resource logics.

On my visit to London, I actively sought out the multiple politics involved: GLA [government], WaterUK [regulator], CIWEM [lobbyist], Thames Water [corporation]. Interested in the ability for design to connect multiple conversations, meetings with multiple people at each organization concluded the unclear and beauracratic management of water in London and the greater EU. The architect lying outside of the traditional discipline.

The project is situated in close proximity to London's city hall by Norman Foster, occupied by the Greater London Authority. Directly utilizing the wanted publicness of this sold-out institution, the Think Tank inverts the polished glass architecture and creates a transparent framework for activity. Near to three of the most visited tourist attractions: Tower Bridge, Tower of London and the City Hall, over 10000 people flow through the site creating an opportunity for people to be exposed to large amounts of information and urban readings. The inversion of the City Hall which has a continuous ramp and open atrium and only public one day of the year, becomes a the main concept for the building's response to its political context. The copper facade of the think tank changes in response to its environement while the interior open pumping station is masked in a glass facade.

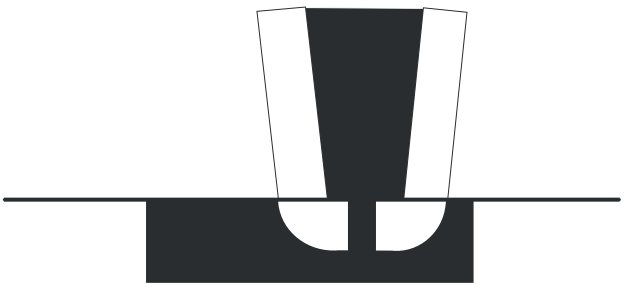
The logic of the Think Tank as a building is designed through the logic of a water tank. A water tank has two insulating layers sectionally, in this instance being replaced by a continuous ramp circulation and office space. Movement around the verticalized pumping station acts as a spatially performative interaction symbolizing the momentary control the Think Tank has in this vast infrastructural network. 25% of the generic office space that think tanks currently work in is used for private offices. The public nature of their work makes this individual space unnecessary. The think tank will instead use this space for public engagement of research. The remaining office space will be reconfigured to better accommodate their collective team meetings on gaining and maintaining political policy of water resources. Both in plan and section, various public program such as a water bar and club, exhibitions and discussions mix the think tank and public. These program molecules then vary the logic of the insulating layers to create a dynamic movement of people through the building mimicking that of the verticalized water pumping station. This creates didactic moments of visual and physical interaction with infrastructure and city, water and people.

The landscape is conceptualized through the notion of revealing content beneath depositional layers of the city and its water infrastructure as a means of discovery. The project retains the site as a park armature for collective societal experience and cultural expression, allowing a flexible framework of architectural forms that move into and out of a draped landscape. The form directly responds to the logic of the infrastructure below, thus allowing a conversation between the surface of the city and its subterranean workings. This new urban relationship through architecture allows for a didactic experience. An undulating form in the landscape and an augmented ground plane marry architecture to landscape, urbanism to architecture and environment to site. Landscape, once the blank canvas for architecture and urbanism, becomes an active tool, shaped by complex urban forces but also, reciprocally, shaping its context.

The physical infrastructures of the twentieth century - those of roads, rail, sewage, water, air, data, amongst others - have tended to operate as singular and independent systems. The infrastructures of the twenty-first century must investigate relationships and transparencies - the pairing of infrastructure and architecture, information and movement. The project takes on political and physical resource flows, territory, new public and informative urbanisms, creating logical and informative architecture coupled with infrastructure. Making visible the infrastructure and creating a public dialogue this project creates a conceptually realistic proposal.

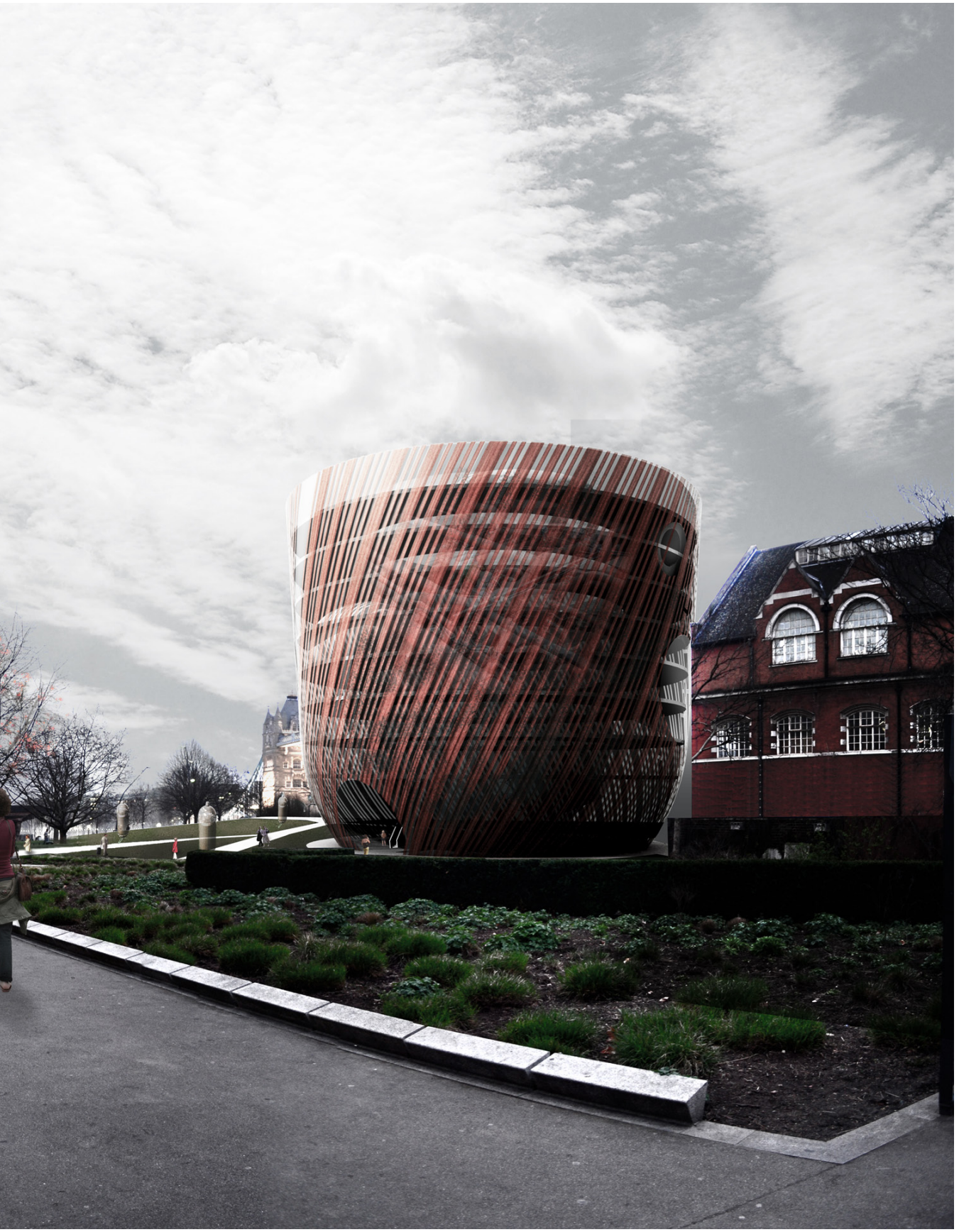
PROGRAM THINK TANK

25% of the generic office space that think tanks currently work in is used for private offices. The public nature of their work makes this individual space unnecessary. The think tank will instead use this space for public engagement of research. The remaining office space will be reconfigured to better accommodate their collective team meetings on gaining and maintaining political policy of water resources.

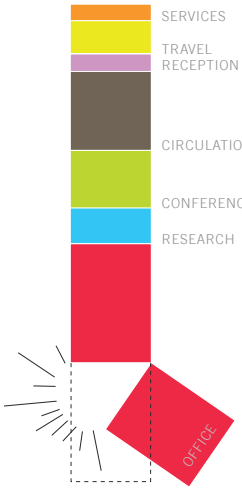


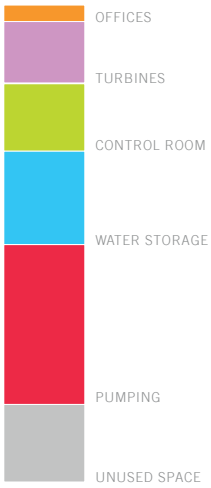
PROGRAM WATER PUMPING STATION

75% of the generic infrastructural space currently is air space aroundhard piping and machines. This in-between space is unnecessary. The think tank will program this space for public engagement of research and prgrammed activities.



300000 SQ FT

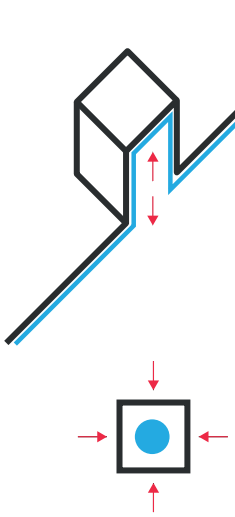




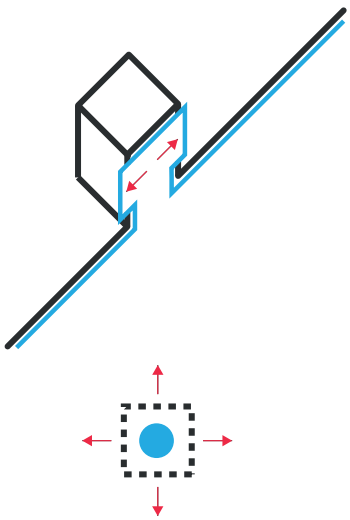
200000 SQ FT

INFRASTRUCTURE AS HIDDEN

PUMPING STATION MASKED IN URBAN DECOR



INFRASTRUCTURE AS EXPOSED

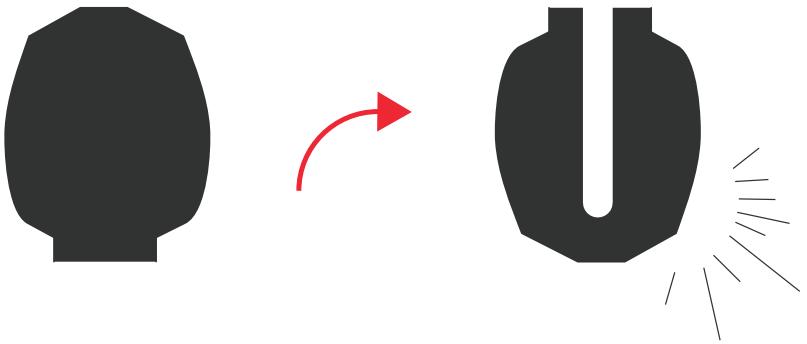


BUILDING A ICON

CITY HALL

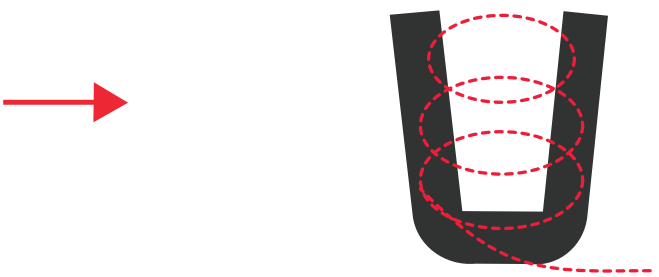
ATRIUM / RAMP CIRCULATION

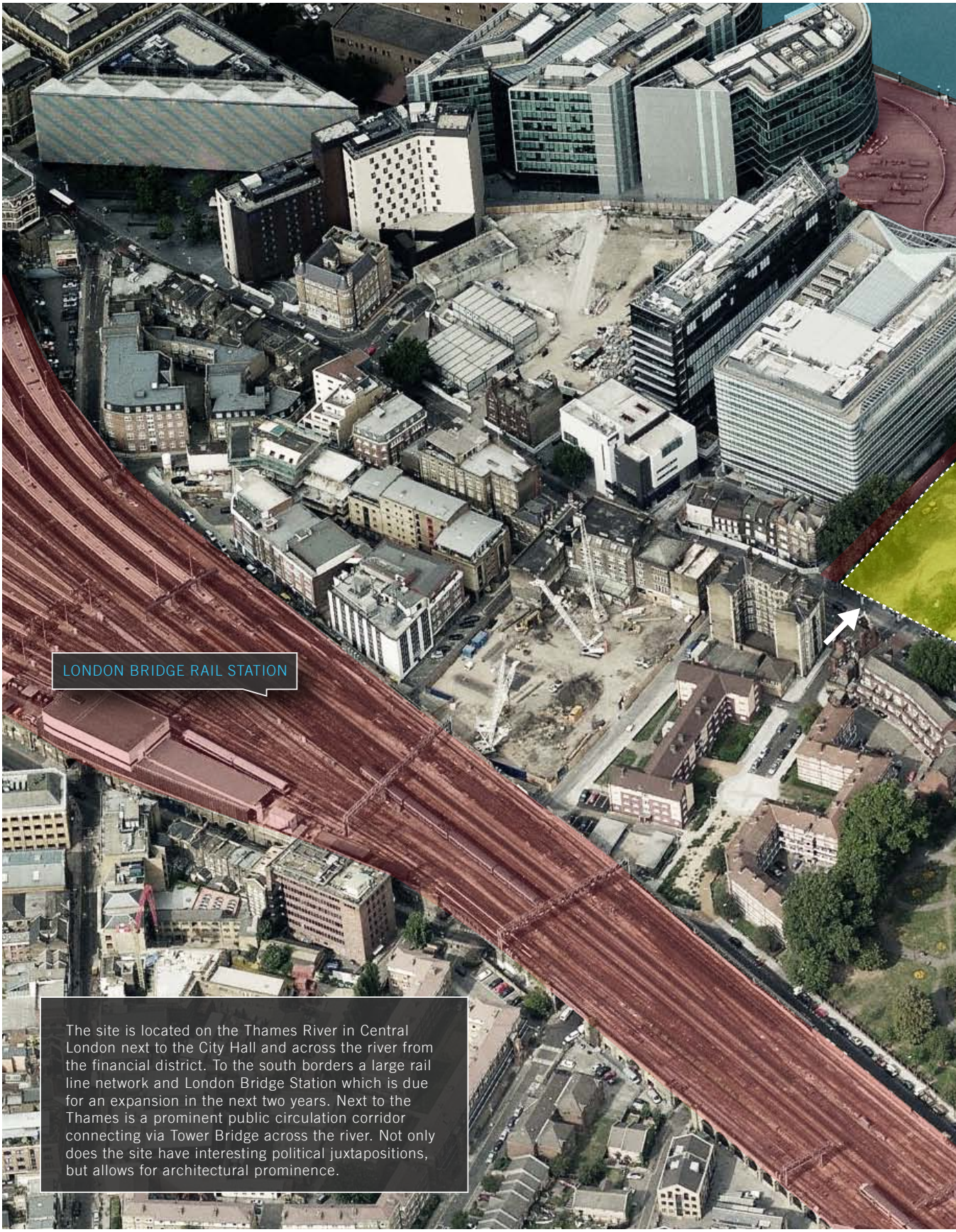
FLIP / INVERT



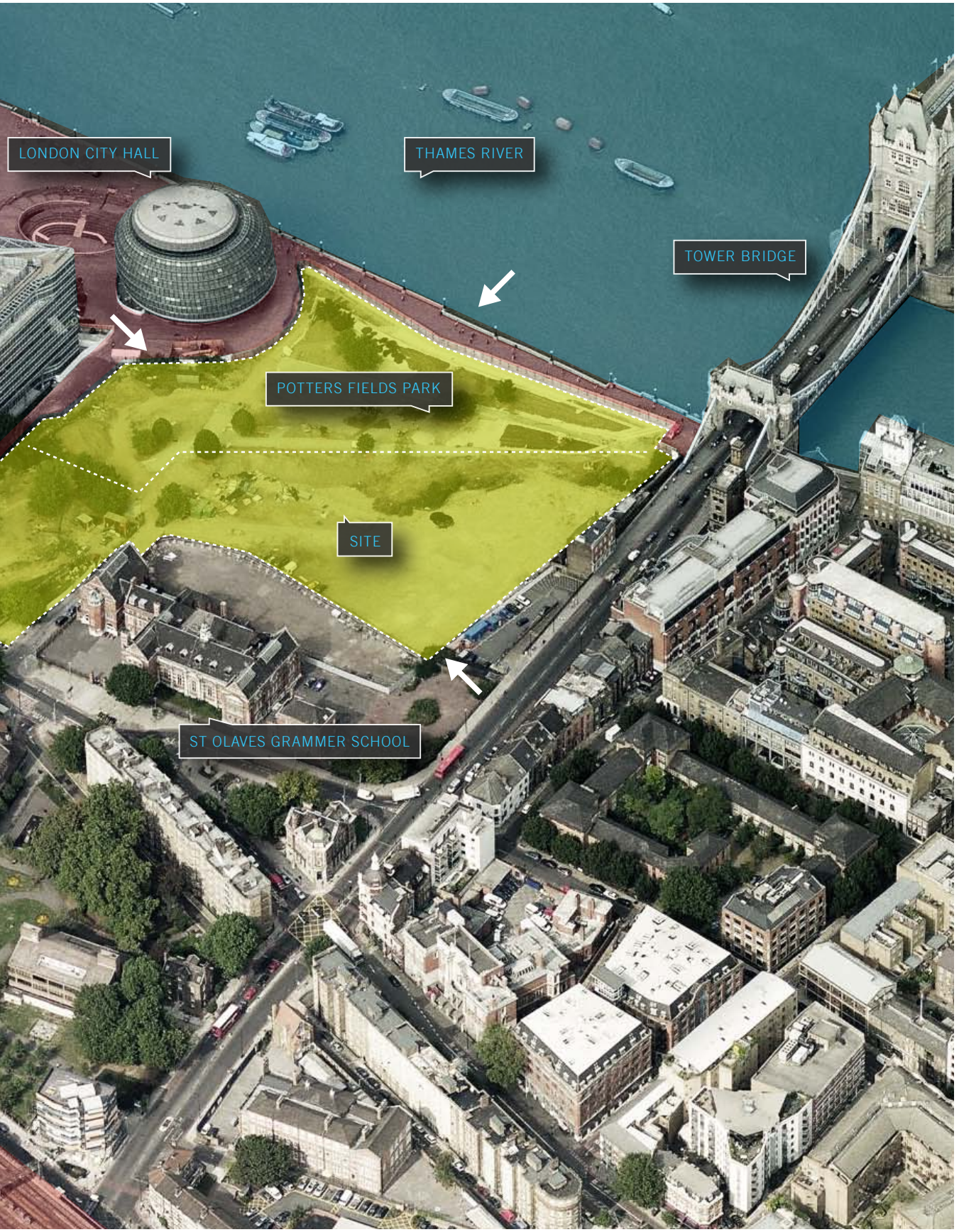
THINK TANK

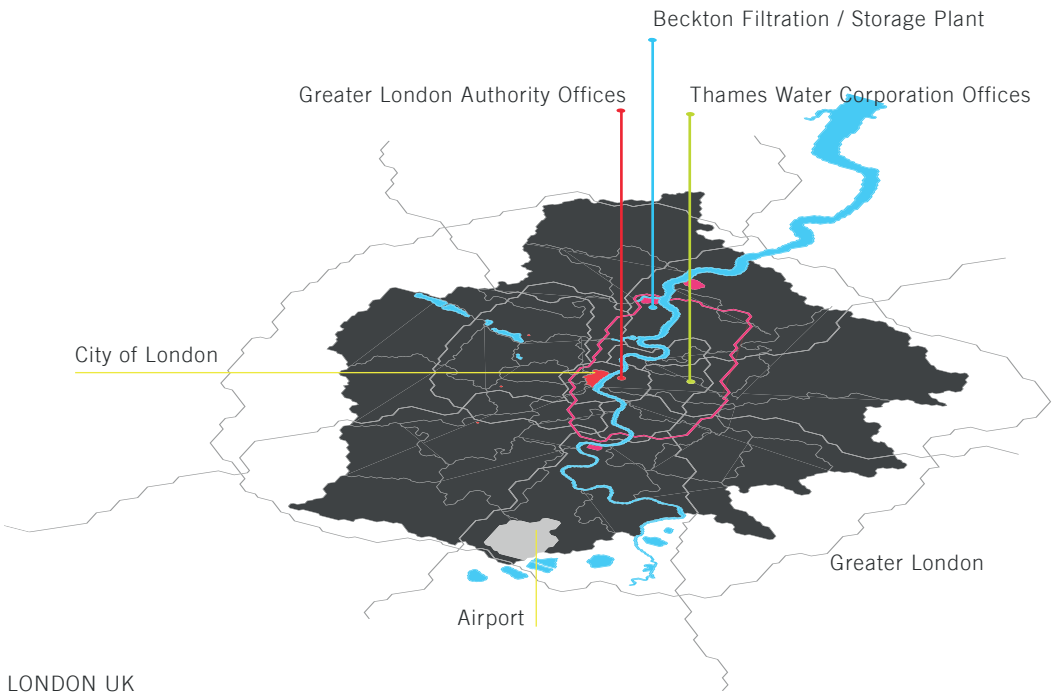
INVERSION OF GLASS ARCHITECTURE





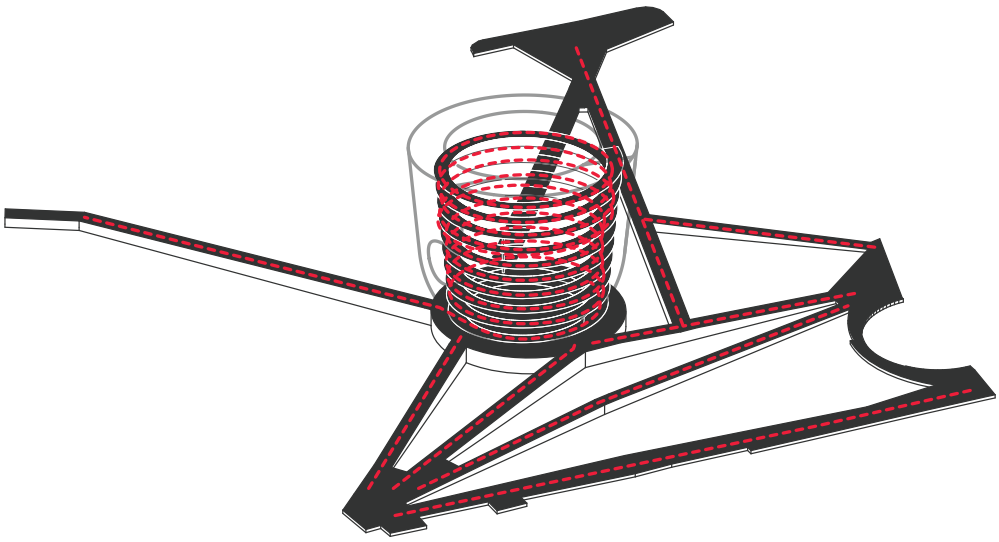
The site is located on the Thames River in Central London next to the City Hall and across the river from the financial district. To the south borders a large rail line network and London Bridge Station which is due for an expansion in the next two years. Next to the Thames is a prominent public circulation corridor connecting via Tower Bridge across the river. Not only does the site have interesting political juxtapositions, but allows for architectural prominence.


LONDON CITY HALL
THAMES RIVER
TOWER BRIDGE
POTTERS FIELDS PARK
SITE
ST OLAVES GRAMMER SCHOOL

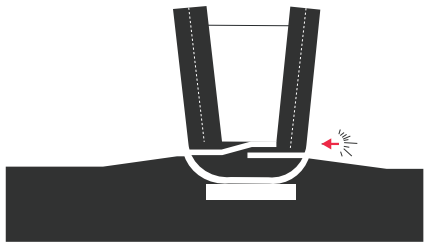


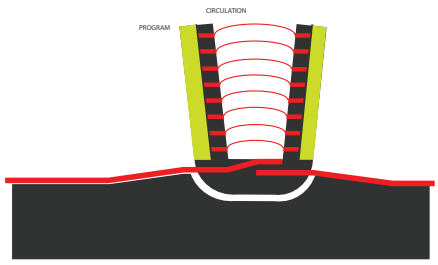
LONDON UK

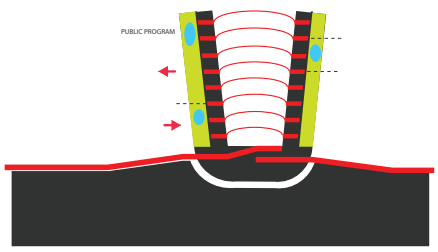
CIRCULATION

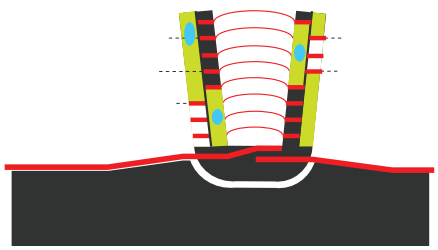


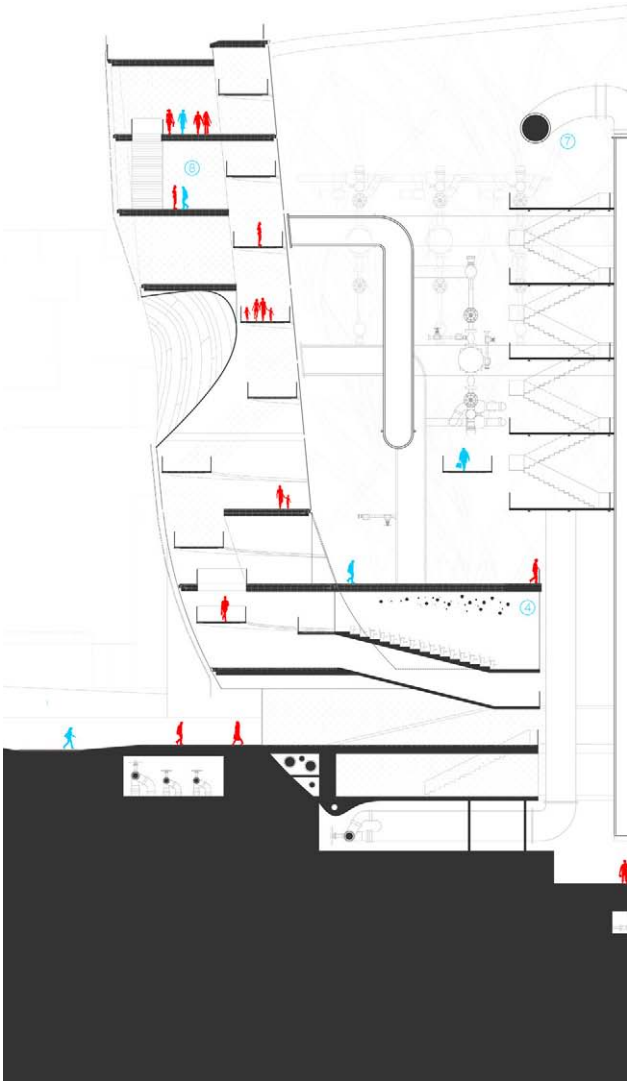
BUILDING FORMATION

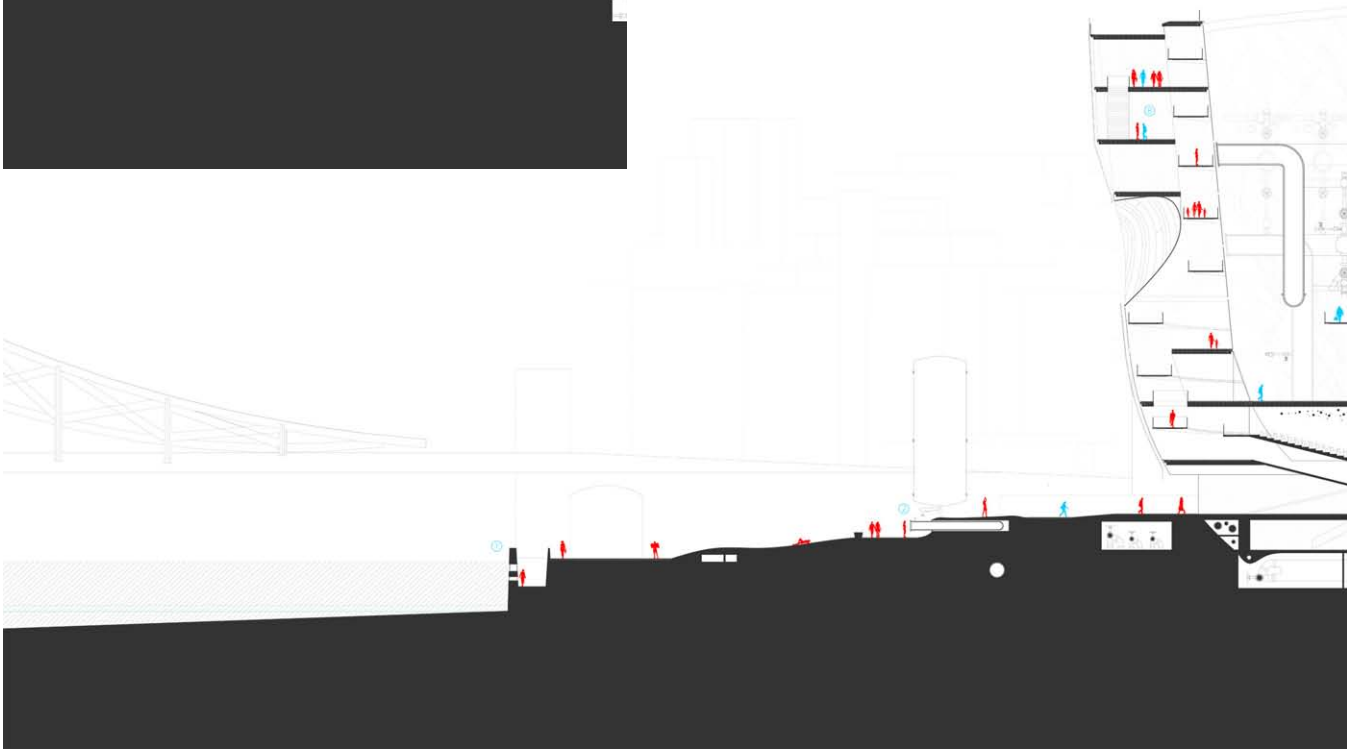


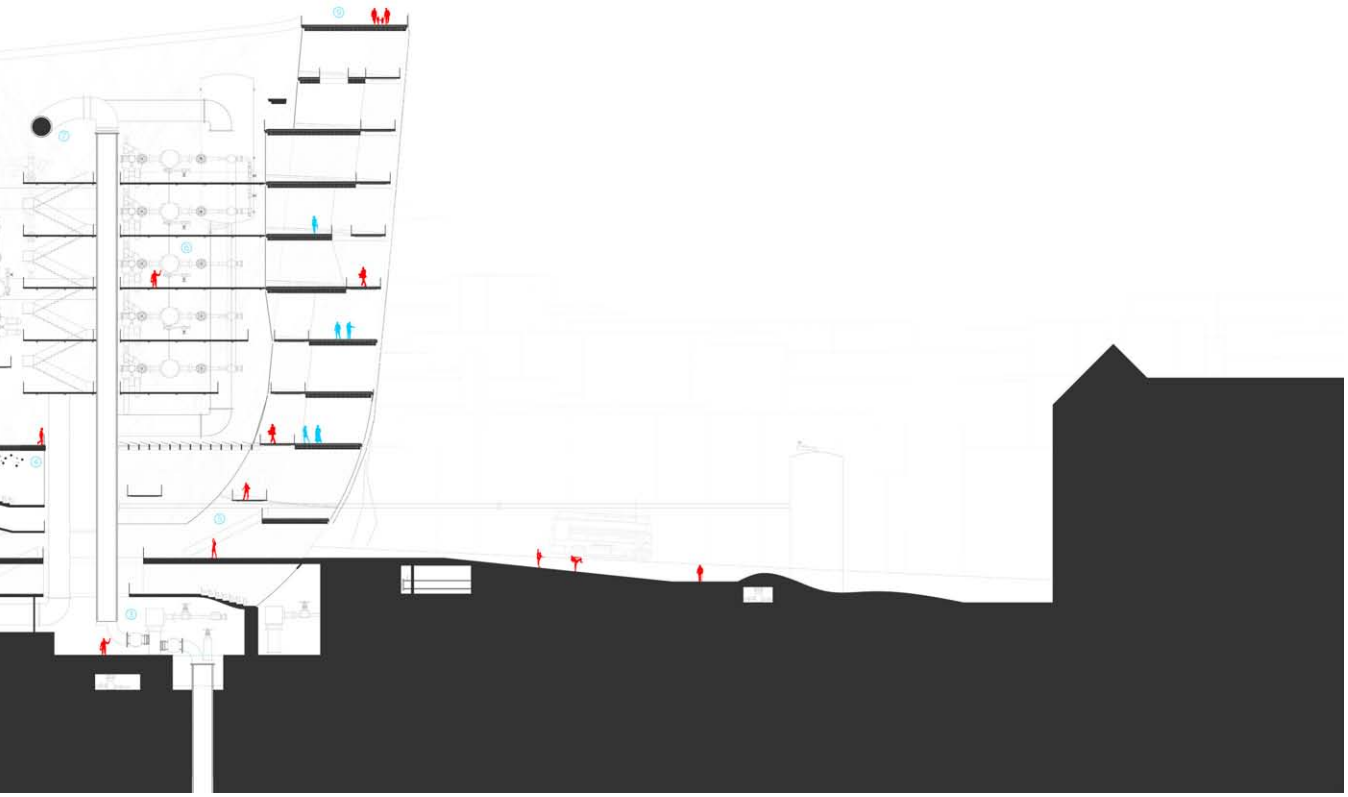


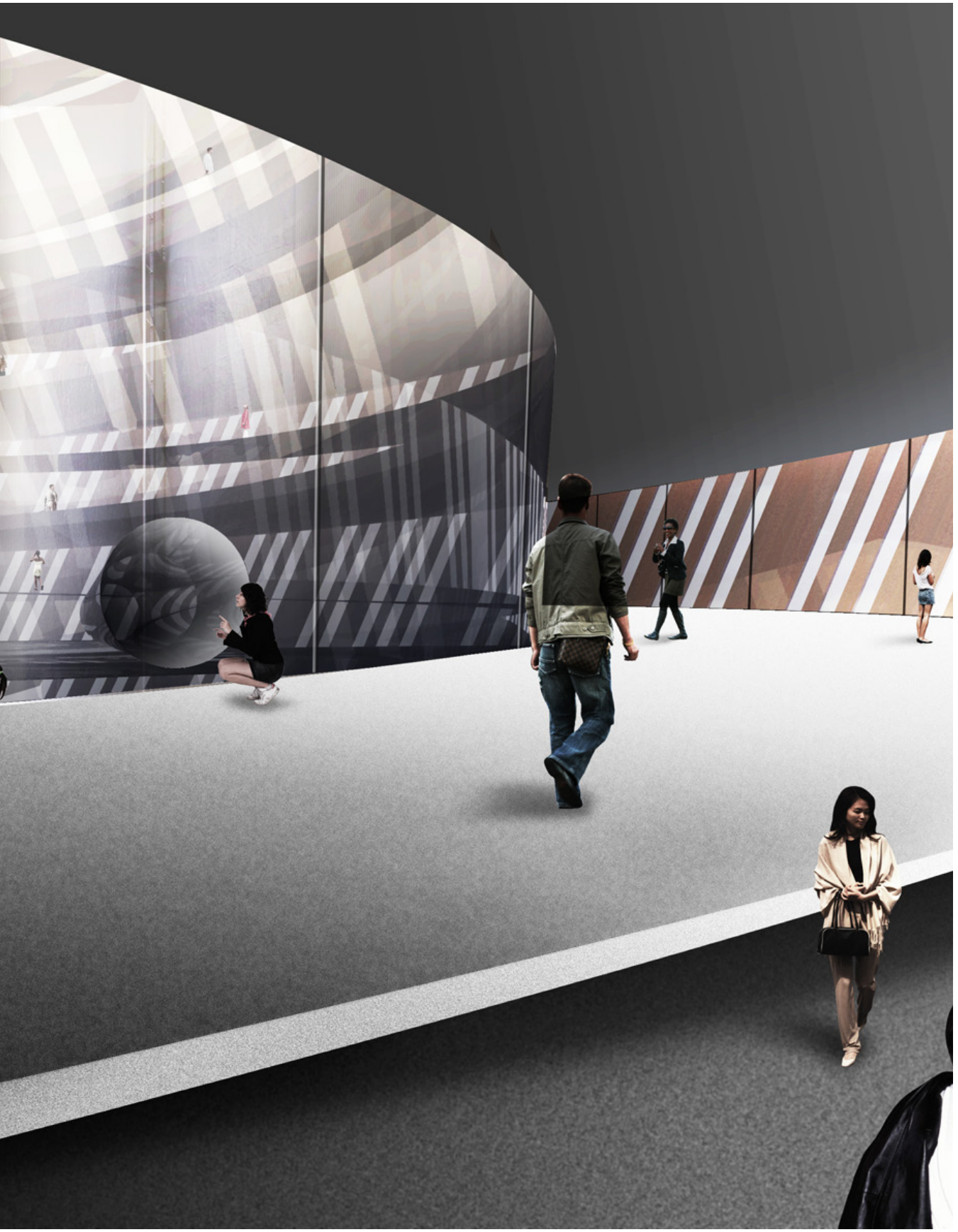












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THESIS BOOK

Timothy Gale
Fall 2010 SPRING 2011

liquidinfrastructure.info

Advisors:
Brendan Moran
Julia Czerniak

1
CONTENTION

Liquid Infrastructure:
Transnational Spaces of Water

2
NETWORK FLOW

Water as Commodity

Hydropolitical Morphology

Infrastructural System

3
TERRITORY

Politics: Corporation + State + Citizenry

Space: Human + Water

Site: EU + London

4
ARCHITECTURE

Think Tank

5
NOTES

Glossary

NOTES
GLOSSARY

Access
The ability to inhabit an area/space granted by an individual or group.

Activism
Action by groups, agencies or individuals using processes to influence change by disrupting the status quo and revealing better visions for society.

City
The physical fabric of 'urban' processes embodying the geographic, political, cultural, social and economic.

Community
The ability for a collection of individuals to form a cohesive grouping supported by other systems, networks, infrastructures.

Control
The ability to manipulate access and direct movements/flows within every aspect of society. When control fail, crisis takes over.

Corporatism
The aggregation of non-human systems of management into a collective body

Crisis
A decisive moment when tensions or instabilities peak and change becomes inescapable. Crisis demands adjustment in perception and in modes of action.

Dehumanization
The process of stripping away human qualities, such as denying others their individuality and self-esteem.

Ecology
Relationships between living organisms and their non-living counterparts.

Emergent
In the process of coming into being. A pattern or condition of new significance.

Citzenry
The many people on our planet who exist in urban environments.

Event
A moment in time which defines place.

Globalization
The making possible of international influence.

Spatial
Relating to space or a network of spaces.

Network
A series of dependent systems of environmental, land-use, communication and service directories. Networks consists of nodes [communities] and vectors {routes].

Nonhuman
Upon treating human characteristic as a product, the result is a reduction, thus non-human.

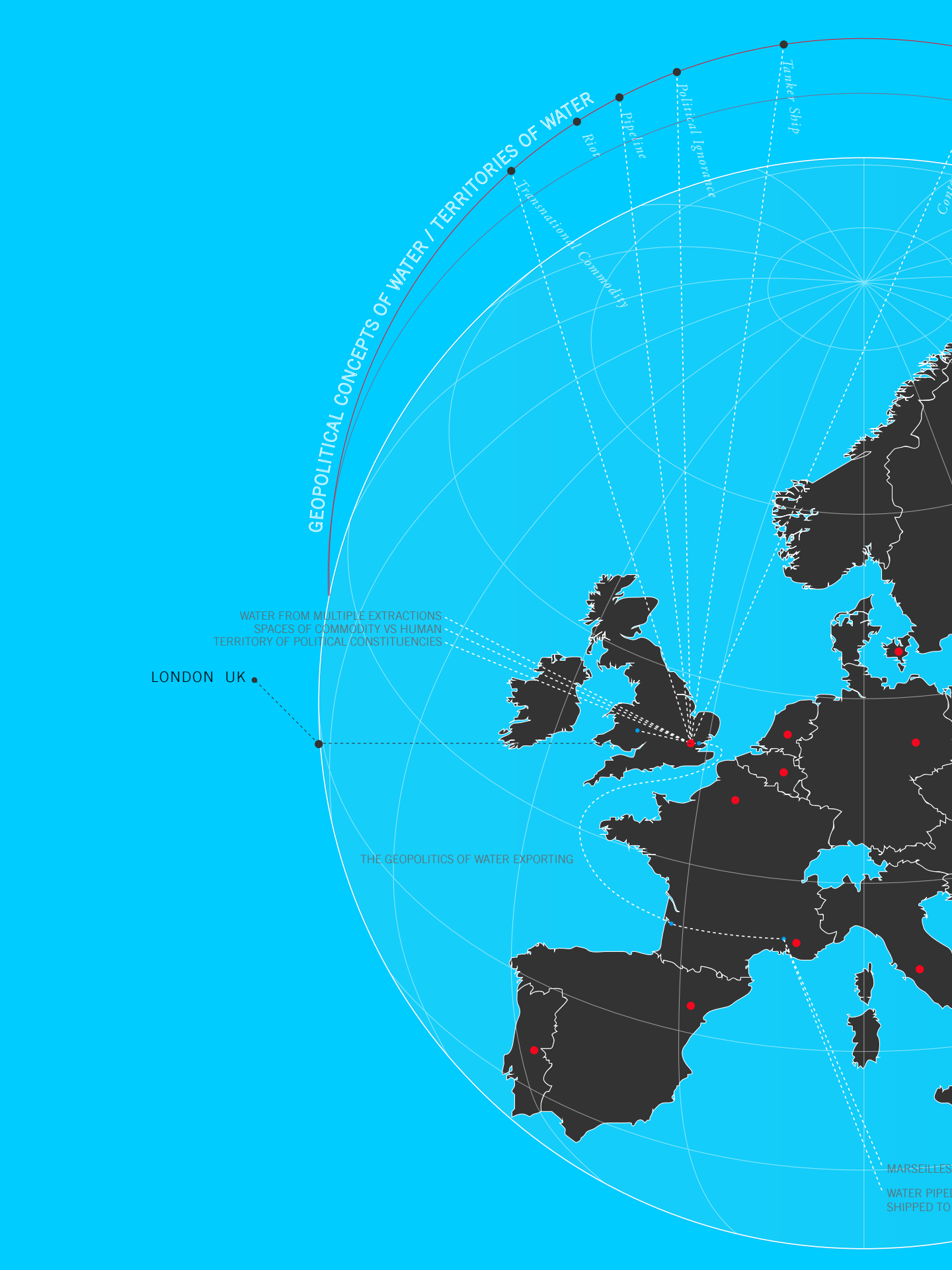
Territory
An area of knowledge, activity or land which is governed by a jurisdictional entity or institution. A political situation which has physical manifestations.

Urban
The process which support, govern and run the 'city'.

Water
A flowing substance consisting of two elements, hydrogen and oxygen. It is also a term full of ambiguity and illustrates the complexity of modern day existence - both psychologically and physically.

Liquid infrastructures aims to examine the emergence of the infrastructural - to articulate it and bring it to bear effectively on the social role and agency within design. Designers are increasingly being compelled to shape larger contexts and scales, to address questions related to infrastructure, urban and ecological systems, cultural and regional issues. These questions which have been associated to the confines of other domains require design engagement and articulation. Analysis in architecture, landscape, urbanism and planning of emergent urban morphologies and global changes on the spatial dimension - comes by way of social anthropology, human geography, economics and

political networks. Liquid infrastructures is interested in extending these arguments by asking how design can have a more active role and transformative impact on the forces shaping contemporary urban realities. The delicate relationship between the physical and social, form and context, the very large and very small - it is important to explore the formal repertoire of the architecture and the agency of the designer within the wider contexts which produce the built environment and subsequently shape society.


GEOPOLITICAL CONCEPTS OF WATER / TERRITORIES OF WATER
Riot
Pipeline
Political Ignorance
Tanker Ship
Transnational Commodity
WATER FROM MULTIPLE EXTRACTIONS
SPACES OF COMMODITY VS HUMAN
TERRITORY OF POLITICAL CONSTITUENCIES
LONDON UK
THE GEOPOLITICS OF WATER EXPORTING
MARSEILLES
WATER PIPE
SHIPPED TO