



Selection of locations for PHA production

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**WOW! CLOSING EVENT – PART 2
FRIDAY SEPTEMBER 8TH – DUBLIN**

Goal of the selection

Using geographical information system (GIS) to define the **most feasible location(s)** for a PHA production facility

Considering: **capacity** and **transport**

Scope:
Scotland



Why using GIS

You'd logically say just pick the largest facility, but:

- First decide the amount of possible facilities
- Multiple large size facilities
- An average size WWTP in between multiple larger ones
- Always an equilibrium between size, distance and capacity
- Possibilities to set:
 - maximum distance
 - maximum facilities
 - ideal amount of total capacity
- Software calculates every possibility



Defining selection method

Data from the Urban WasteWater Treatment Directive (UWWTD)

- Wastewater treatment plant (WWTP) locations
- Technical specifications

Requirement of **2,000,000 PE** (\approx 5,000 ton PHA) for feasibility

All WWTPs with **primary treatment** and **> 50,000 PE** considered

WWTPs **> 300,000 PE** have potential for a dryer (installation) onsite

Potential for Scotland

153 WWTPs > 2,000 PE

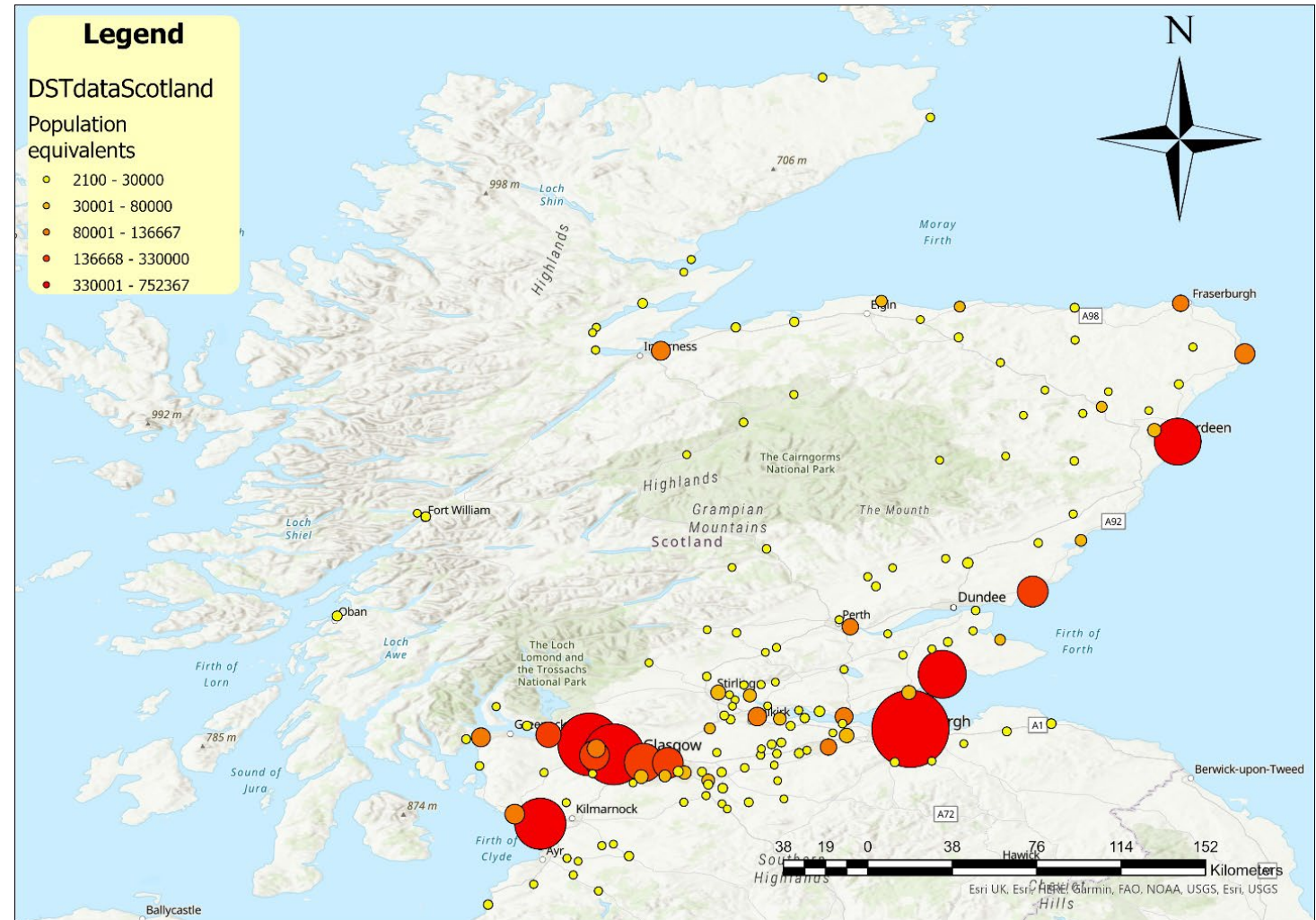
6.1M PE → max **3 facilities**

27 WWTPs > 50,000 PE

4.6M PE → max **2 facilities**

Biggest ones in:

- Aberdeen
- Edinburgh
- Glasgow (2x)



Potential for Scotland



- Aberdeen: PE count not over 900,000 PE (within 160km)

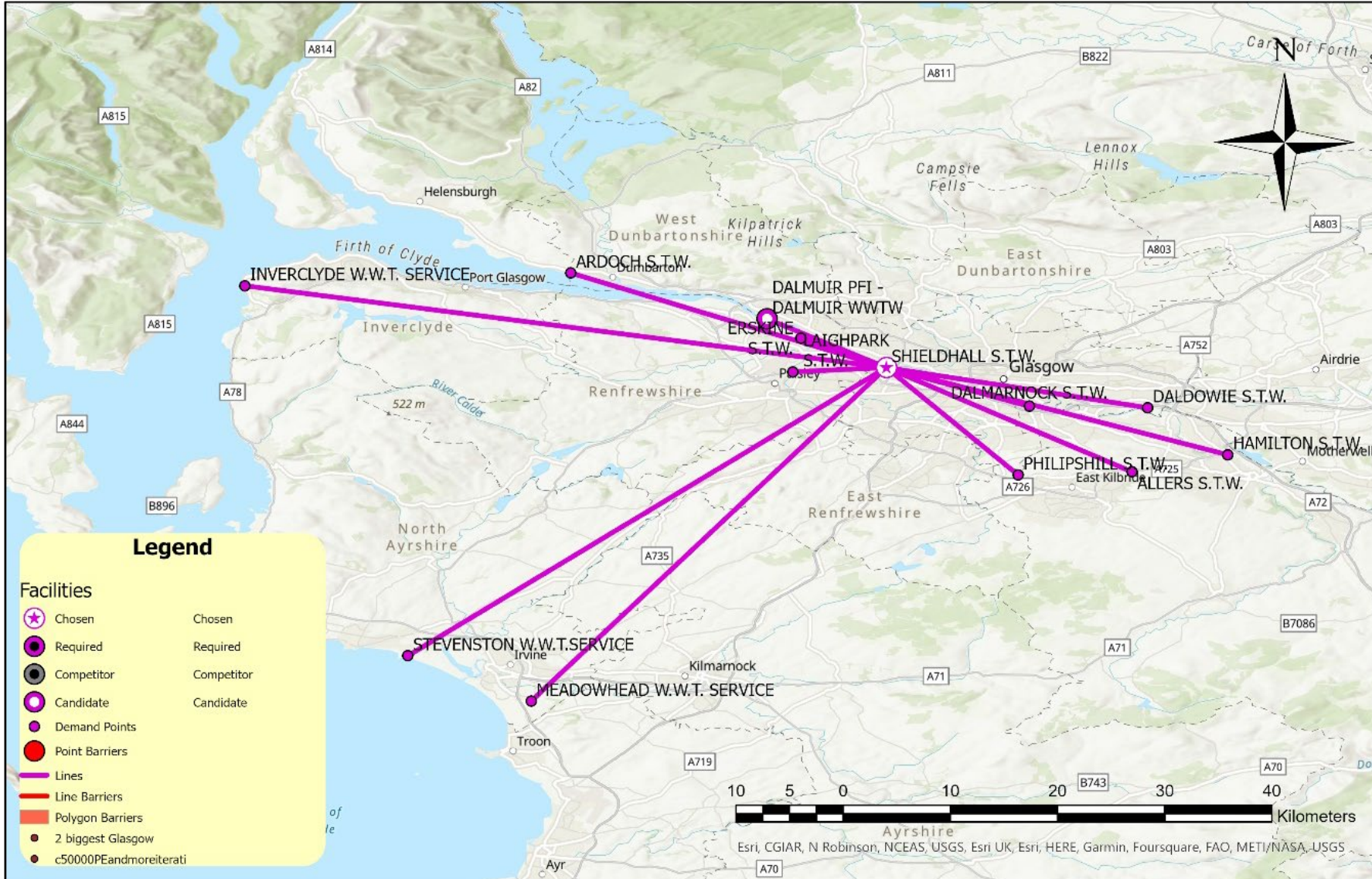


- Edinburgh: PE count not over 1.5M PE before overlap with Glasgow



- Glasgow: 2.6M PE available within 45km (28 miles) distance

Glasgow scenario



Chosen facility:
Shieldhall S.T.W.

12 contributing
facilities within
45km distance

Total 2.6M PE

Glasgow scenario

Name	PE	Distance (km)
DALMUIR PFI - DALMUIR WWTW	581,220	11.32
SHIELDHALL S.T.W.	563,713	0
MEADOWHEAD W.W.T. SERVICE	332,371	42.09
DALDOWIE S.T.W.	317,927	16.98
DALMARNOCK S.T.W.	232,840	9.87
LAIGHPARK S.T.W.	126,440	7
INVERCLYDE W.W.T. SERVICE	87,914	40.25
ERSKINE S.T.W.	83,015	6.82
STEVENSTON W.W.T.SERVICE	82,813	42.51
HAMILTON S.T.W.	63,430	22.71
ARDOCH S.T.W.	61,219	23.22
PHILIPSHILL S.T.W.	54,258	15.97
ALLERS S.T.W.	49,818	19.9
TOTAL	2,636,978	

Chosen facility:
Shieldhall S.T.W.

12 contributing
 facilities within
45km distance

Total 2.6M PE

Glasgow scenario (2M PE)

Transporting primary sludge (5%DM)

Name	PE	Distance (km)
DALMUIR PFI - DALMUIR WWTW	581,220	11.32
SHIELDHALL S.T.W.	563,713	0
MEADOWHEAD W.W.T. SERVICE	332,371	42.09
DALDOWIE S.T.W.	317,927	16.98
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PHILIPSHILL S.T.W.	54,258	15.97
ALLERS S.T.W.	49,818	19.9
TOTAL	2,009,231	

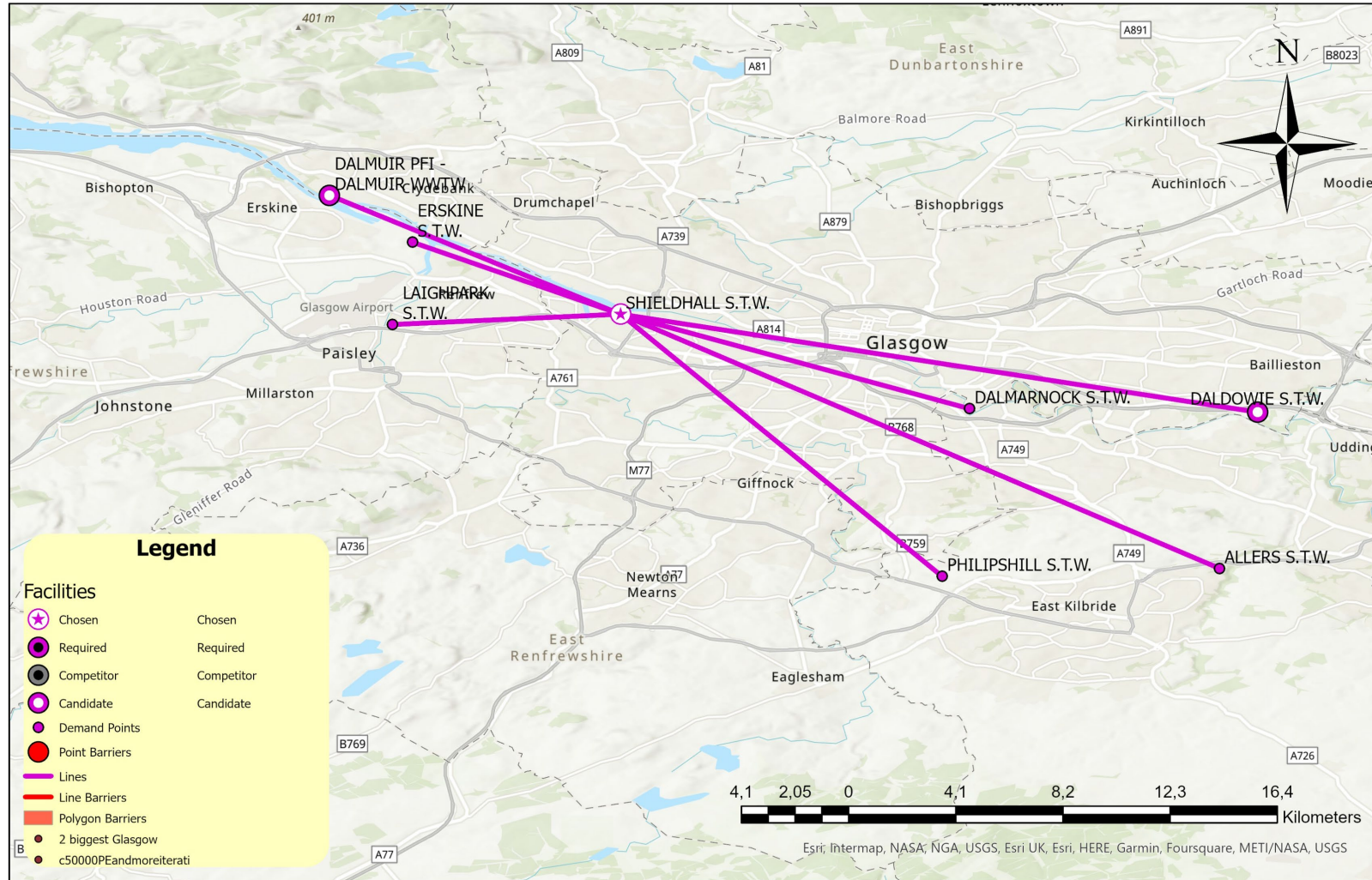
Chosen facility:
Shieldhall S.T.W.

7 contributing
 facilities within
20km distance

Smaller ones closer
 by are chosen

Glasgow scenario (2M PE)

Transporting primary sludge (5%DM)



Chosen facility:
Shieldhall S.T.W.

7 contributing facilities within **20km** distance

Total transport:
180,000km

Glasgow scenario

Bringing it closer to required 2M PE and
only transport dried sludge (facilities > 300,000 PE)

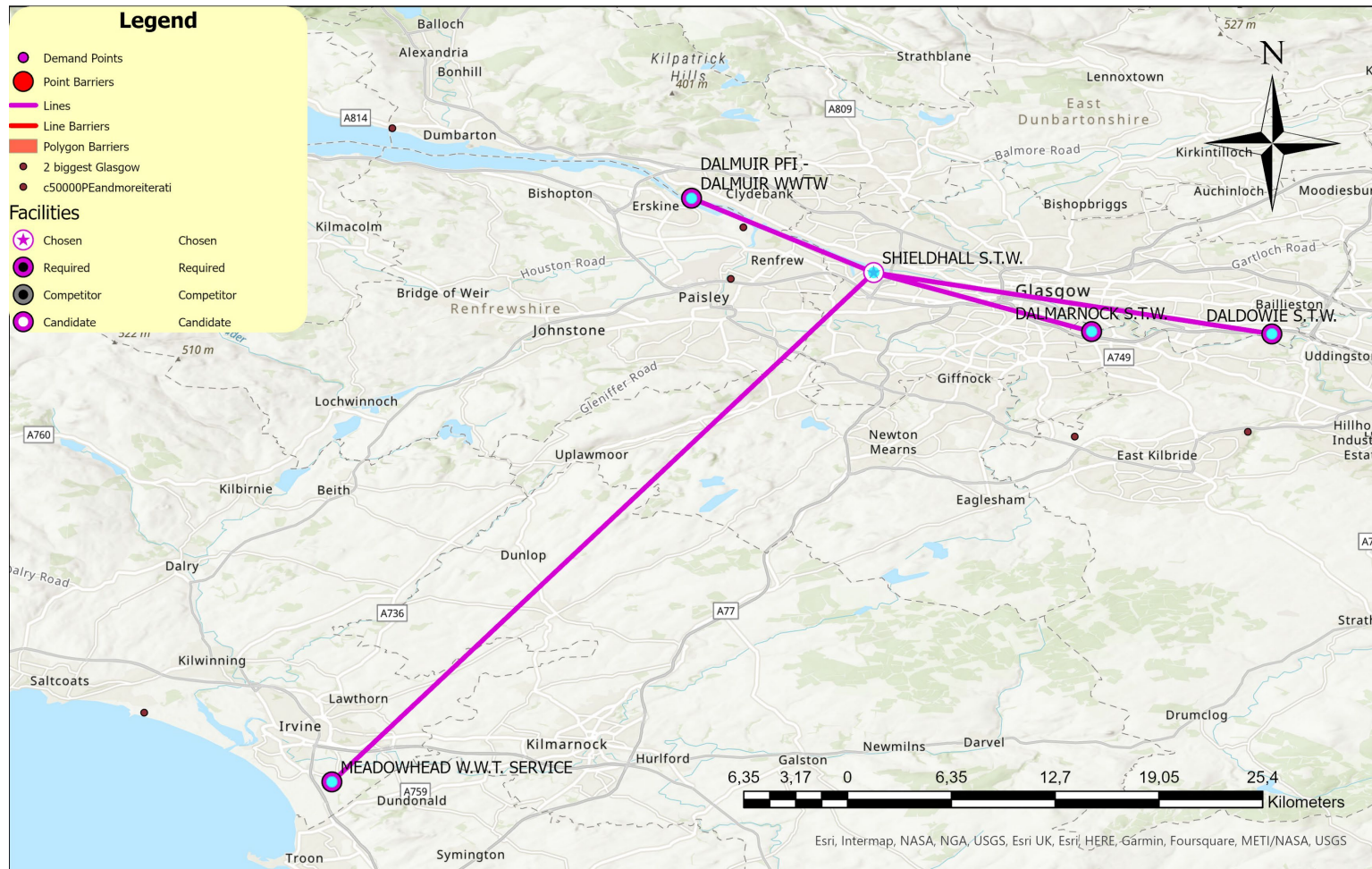
Name	PE	Distance (km)
DALMUIR PFI - DALMUIR WWTW	581,220	11.32
SHIELDHALL S.T.W.	563,713	0
MEADOWHEAD W.W.T. SERVICE	332,371	42.09
DALDOWIE S.T.W.	317,927	16.98
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ARDOCH S.T.W.	61,219	23.22
PHILIPSHILL S.T.W.	54,258	15.97
ALLERS S.T.W.	49,818	19.9
TOTAL	2,028,071	

Chosen facility:
Shieldhall S.T.W.

4 contributing
 facilities within
42km distance

Glasgow scenario

Bringing it closer to required 2M PE and
 only transport dried sludge (facilities > 300,000 PE)



Chosen facility:
Shieldhall S.T.W.

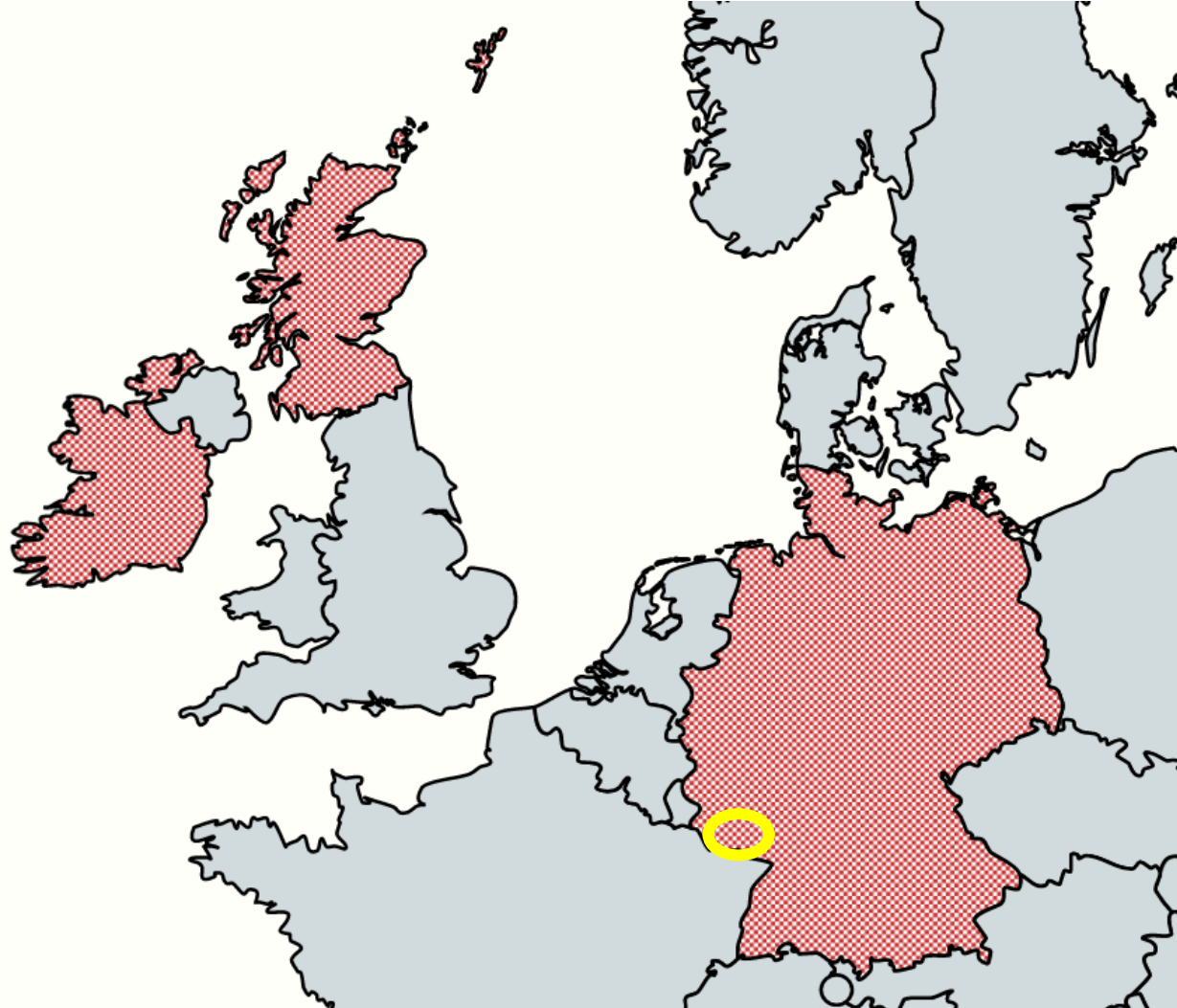
4 contributing
 facilities within
42km distance

Total transport
15,500km

Broader analysis

Same analysis also
done for **Ireland** and
Saarland/Germany

Project scope:



Further steps

Financial analysis of different scenarios

- Economic aspects of PHA production – I. Hobus – WiW mbH

Circularity assessment of different scenarios

- Circularity of PHA production – J. Gallagher – Trinity College Dublin



WUPPERVERBAND
für Wasser, Mensch und Umwelt

