

Report on field trip from 12th to 16th of June, 2017

1. Aims of the field trip:

- Validating the finding of Utilis in a pilot project;
- Making acquaintance to use Utilis's data in the field for leak detection (GIS files, Web application, leak sheets, data form);
- Getting use to the acoustic method which are using today for finding leakage;
- Developing relationship with other parties in the project.

2. Time:

From June 12th 2017 until June 16th 2017

3. Places:

Budapest, Miskolc.

4. Activities:

- Overlaying suspected leak map received from Utilis and water pipe network map from water work companies in Budapest and Miskolc;
- Based on the map, pipe type, realistic condition (traffic condition, background noise condition, advantage and disadvantage of acoustic method), planning the daily routes for validation.
- Making comparison between parties' suggestion and comment on potential list of checking points.
- Navigating to the suspected leak location;
- Finding listening points (hydrants, valves, fountains...) within and outside of suspected circle for each leak and gather all of possible information of the leak;
- Use the acoustic method to validate the Utilis' finding;
- Filling out all information available on the corresponding leak sheet (survey date, leak type, pipe material, visible status of leak, result of validation, exact location of leak on the large scale map, time for fixing, estimating of loss size, topography condition, actual address of finding, verbal description);
- Marking leak location on the ground, making note of noticeable information, taking photos of leaks, discussion and making comments or suggestion to water work company at each leak;
- Filling out the leak data sheet in order to get the overview result;
- Taking part in the presentation given by Utilis' expert to go in depth of Utilis' technology;
- Summary and write field activity report;

5. Results:

Total length pipe in Budapest is 5200 km, and in Miskolc is 470 km.

- Overlaying maps for both Budapest and Miskolc;
- 32 Leak sheets filled out;
- 2 Leak data sheets filled out for both Budapest and Miskolc;
- 100 Photos of leaks and field trip activities;
- An estimated number of water loss via verified leaks;
- Report;

Visited points in Miskolc:

Utilis_ID	Crew #	Survey Date	Prime	Number	Street	City/Suburb	Postcode	Verified	Verified with UTILIS	Leak	Suspect	Quiet	Leak type	Pipe type	Estimated Leak Size [L/M]	Comments
00042	1	6/15/2017	No	4	Szeles utca	Miskolc	3526	Yes	yes		x					Already fixed leak at this location
00043	1	6/15/2017	No	158	Tetemvár felsősor	Miskolc	3526			x			Service		0.1	Visible, dripping point, other subpoint was fixed 1 week ago
00051	1	6/15/2017	No	25	Károly utca	Miskolc	3532	Yes	yes	x			Service		25	Hydrant leaking also with 0.2l/m
00081	1	6/15/2017	No	28	Bollóalja utca	Miskolc	3518	Yes	yes			x				
00098	1	6/14/2017	No	4	Szerb Antal utca	Miskolc	3521	Yes	yes			x				
00101	1	6/14/2017	No	2	Iskola tér	Miskolc	3528	Yes	yes		x		Main			Non-visible
00102	1	6/14/2017	No	29	Alkotmány utca	Miskolc	3528	Yes	yes		x		Main	PVC		Not enough listening points, non-visible
00103	1	6/14/2017	No	7	Csokonai Vitéz Mihály utca	Miskolc	3528	Yes	yes		x		Service			On private property (factory)
00109	1	6/15/2017	No		Eper utca	Miskolc	3508	Yes	yes		x					Hydrant leaking, possible hot water

00110	1	6/14/2017	No	28	Áfonyás utca	Miskolc	3529	Yes	yes	x			Service		near newly repaired pipe 5/18/2017
00112	1	6/14/2017	No	18	Hajós Alfréd utca	Miskolc	3524	yes	yes			x			noise may come from warm water pumping system
00114	1	6/14/2017	No	30	Klapka György utca	Miskolc	3524	yes	yes	x			Main		leak identified at 2 listening points, non-visible
00133	1	6/15/2017	No	6	Andrássy Gyula utca	Miskolc	3532	Yes	yes			x			Near a newly fixed 300mm pipe
00134	1	6/16/2017	No	14	Fenyves utca	Miskolc	3534	Yes	yes	x			Service	35	3 sub leaking points surrounding
00138	1	15/6/2017	No	28	Glanzer Miksa utca	Miskolc	3533	Yes	yes			x		1	Was found from December 2016
00174	1	6/15/2017	No		Rigófütty utca	Miskolc	3508	Yes	yes			x			Already fixed leak at this location

Visited points in Budapest:

Utilis_ID	Crew #	Survey Date	Prime	Number	Street	City/Suburb	Postcode	Verified	Verified with UTILIS	Leak	Suspect	Quiet	Leak type	Pipe type	Estimated Leak Size [L/M]	Comments
00311	1	6/13/2017	No	27	Oszkó utca		1188	Yes	Yes	x					0.03	
00323	1	6/13/2017	No	18	Arany János utca		1188	Yes	Yes	x					8.3	non-visible, due to the old rubble ring at the bottom of hydant
00378	1	6/13/2017	No	21	Zalán utca		1183	Yes	Yes			x				
00393	1	6/13/2017	No	42772	Kupa utca		1183	Yes	Yes			x				
01127	1	6/13/2017	No	13	Hurok utca	Budapest	1091	Yes	Yes		x					exist a water tank
01128	1	6/13/2017	No	12	Ifjú munkás utca	Budapest	1091	Yes	Yes			x				
01146	1	6/13/2017	No	51A/D-65A/D	Százados út	Budapest	1087	Yes	Yes			x				
01289	1	6/12/2017	No	84	Rézsű utca	Budapest	1029	Yes	Yes			x				
01292	1	6/12/2017	No	4b	Ábránd utca	Budapest	1029	Yes	Yes			x				
01293	1	6/12/2017	No	121	Ördögárok utca	Budapest	1029	Yes	Yes			x				
01295	1	6/12/2017	No	29	Táltos utca	Budapest	1029	Yes	Yes	x					1	
01302	1	6/12/2017	No	28-30	Petőfi utca	Budapest	1028	Yes	Yes			x				
01310	1	6/12/2017	No	3	Kokárda utca	Budapest	1028	Yes	Yes			x		AC		

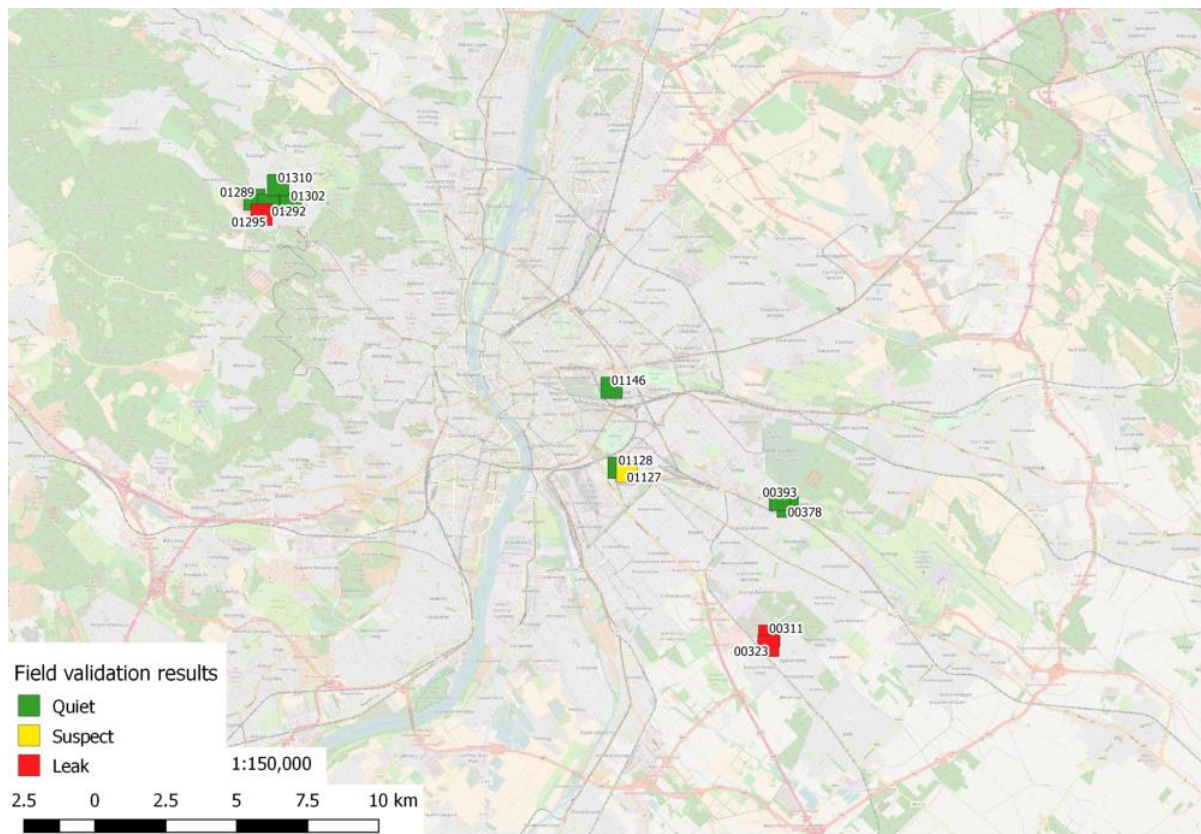
6. Recommendations:

Field verification limitations various in reality:

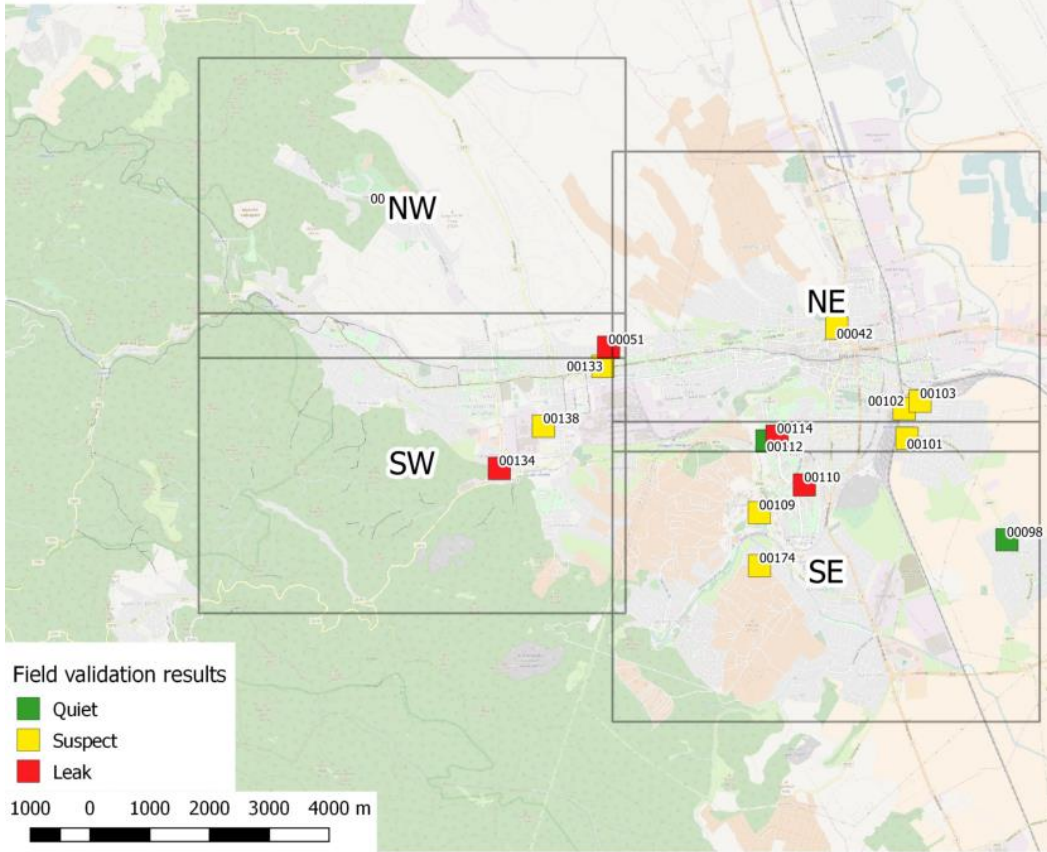
- No access to GIS, time wasted and some access points not found;
- Plastic pipes in some areas – difficult for acoustics;
- Sounds found only on hydrants – smaller leaks maybe not found?
- Geographical limitation- no access to “city-center”;
- Hilly terrain of the first day – creates extreme error in geo-referencing (drawbacks of method itself).

7. Appendix:

7.1. Overlay maps

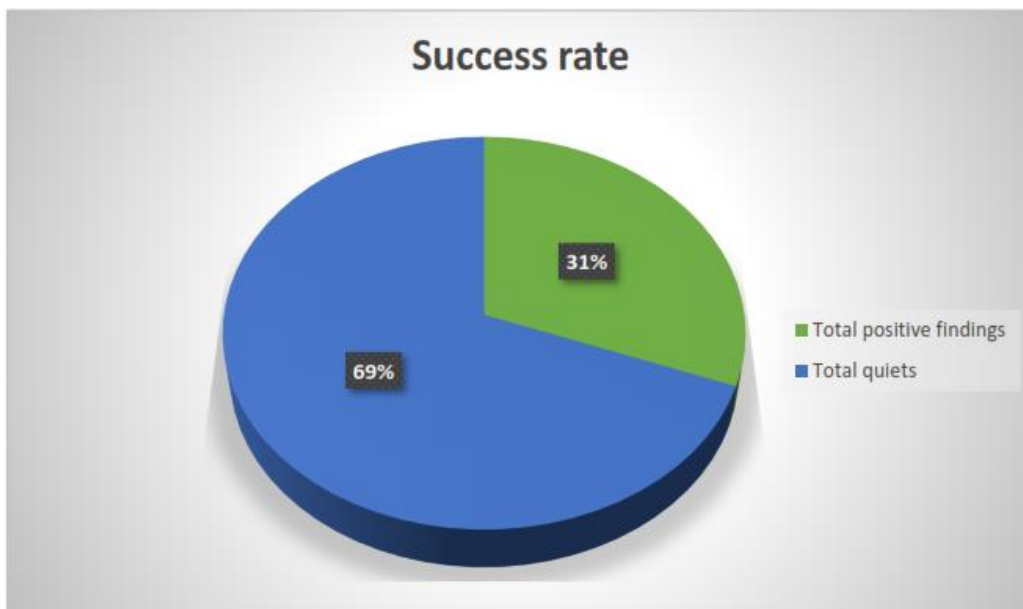


Miskolc, overview 1:75,000

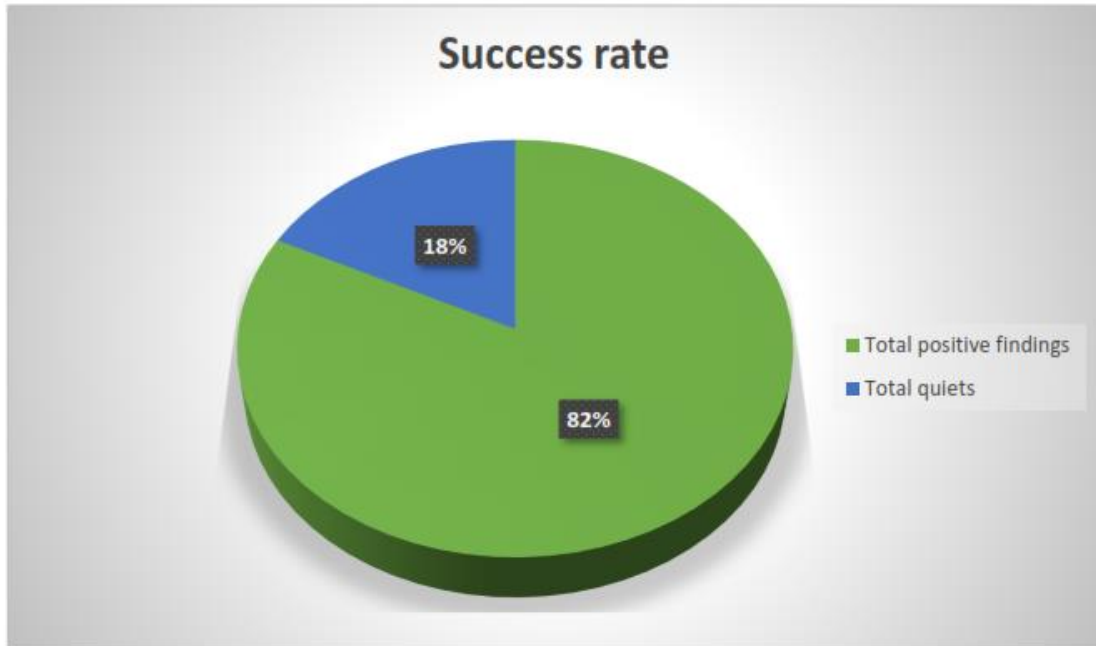


7.2. Leak data sheets

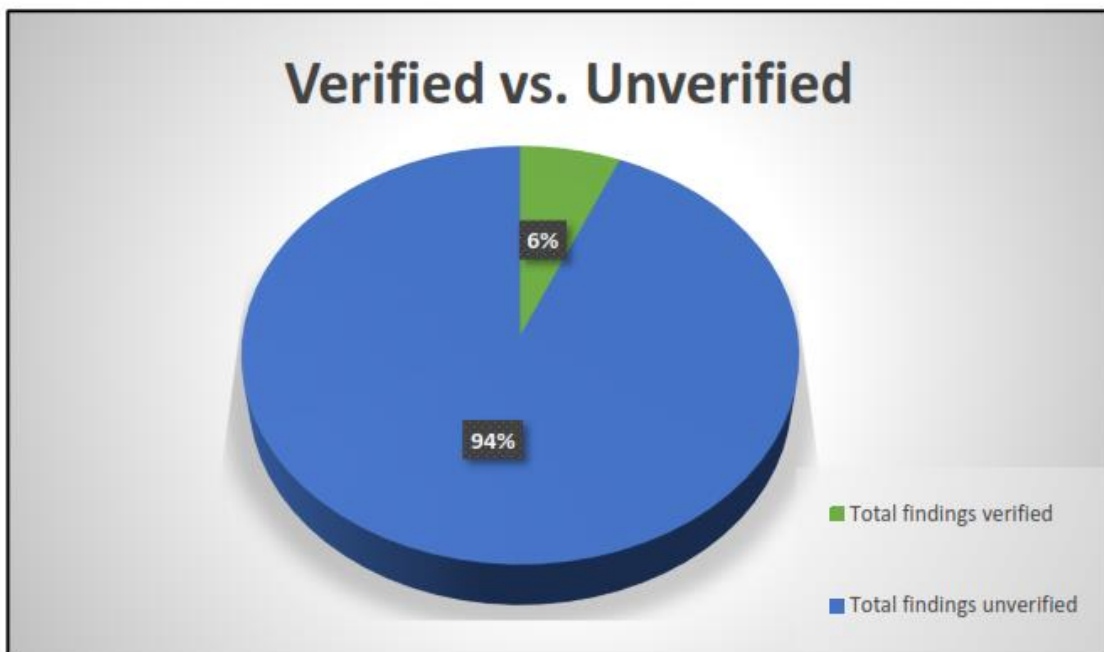
Total leaks detected	3	Total positive findings	4
Total suspected	1	Total verified findings	13
Total quiet	9	Detection success rate	31%



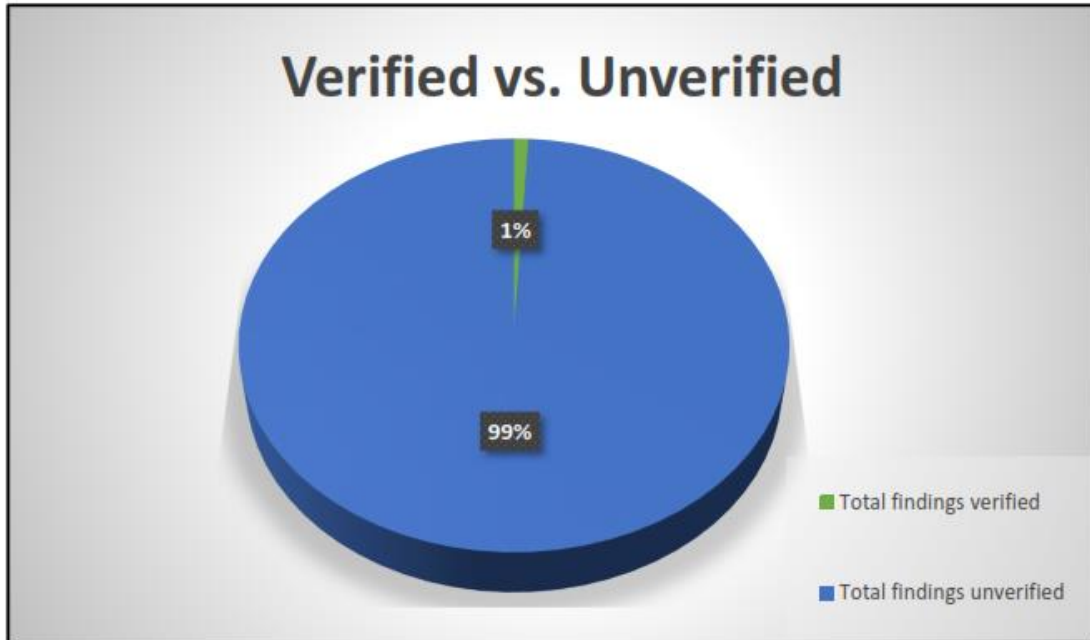
Total leaks detected	6	Total positive findings	14
Total suspected	8	Total verified findings	15
Total quiets	3	Detection success rate	93%



Total findings delivered	235
Total findings verified	15
Total findings unverified	220



Total findings delivered	1409
Total findings verified	13
Total findings unverified	1396



7.3. Field trip photo
Suspected leak 01292-01293



Suspected leak 00311



Suspected leak 00323



Suspected leak 01127



Suspected leak 00110



Suspected leak 00114



Suspected leak 00043



Suspected leak 00051



Suspected leak 00138



Suspected leak 00134

