CLAIMS

1. System (100) for monitoring an environmental condition in a storm drain (102, 104), the system comprising;

a storm drain (102, 104), containing a filter device (134) comprising a filter unit (130) and a floating carrier (132) for carrying the filter unit (130),

at least one sensor (106, 108, 110, 112, 114) arranged in the storm drain (102, 104), for determining an environmental condition in the storm drain (102, 104),

the at least one sensor (106, 108, 110, 112, 114) being arranged in communication with a sub node (116, 118) for transmitting data regarding the determined environmental condition in the storm drain (102, 104) to the sub node (116, 118),

the sub node (116, 118) being arranged in communication with a main node (120) for transmitting data regarding the determined environmental condition in the storm drain (102, 104) to the main node (120),

the main node (120) being arranged to process the data received in order to monitor the environmental condition in the storm drain (102, 104).

2. System (100) according to claim 1, wherein the at least one sensor (106, 108, 110, 112, 114) is arranged in communication with the sub node (116, 118) by means of a radio frequency connection.

3. System (100) according to claim 1 or 2, wherein the at least one sensor (106, 108, 110, 112, 114) is arranged on the filter unit (130) of the filter device (134), on the floating carrier (132) of the filter device (134), or in the storm drain (102, 104) in a position separate from the filter device (134).

4. System (100) according to any one of the preceding claims, wherein the at least one sensor (106, 108, 110, 112, 114) is chosen from the group consisting of; a pressure sensor, a flow sensor, a temperature sensor, a humidity sensor, a light sensor, a gas sensor, a carbon dioxide sensor, an

acceleration sensor, a hydro carbon sensor, an electrical field distribution sensor, and an electrical field penetration sensor.

5. System (100) according to any one of the preceding claims, wherein the sub node (116, 118) is arranged in communication with the main node (120) by means of a radio frequency connection.

6. System (100) according to any one of the preceding claims, wherein the main node (120) is arranged in communication with at least one external sensor (122, 124) arranged outside the storm drain (102, 104) for determining an environmental condition outside the storm drain (102, 104), the communication being direct from the external sensor (122, 124) outside the storm drain (102, 104) to the main node (120) or indirect to the main node (120) by means of a sub node.

7. System (100) according to claim 6, wherein the at least one external sensor (122, 124) arranged outside the storm drain is chosen from the group consisting of; a temperature sensor, an oxygen sensor, a carbon dioxide sensor, a moisture sensor, a light sensor, an acceleration sensor and a combustion gas sensor.

8. System (100) according to any one of the preceding claims, wherein the main node (120) is arranged in communication with at least one remote resource (126, 127).

9. System (100) according to claim 8, wherein the main node (120) is arranged in communication with the at least one remote resource (126, 127) by means of a radio frequency connection.

10. Method (200) for monitoring an environmental condition in a storm drain (102, 104), the method comprising;

providing (202) a storm drain (102, 104) containing a filter device (134) comprising a filter unit (130) and a floating carrier (132) for carrying the filter unit (130),

arranging (204) at least one sensor (106, 108, 110, 112, 114) in the storm drain (102, 104),

determining (206) an environmental condition in the storm drain (102, 104) using the at least one sensor (106, 108, 110, 112, 114),

arranging (208) the at least one sensor (106, 108, 110, 112, 114) in communication with a sub node (116, 118),

transmitting (210) data regarding the determined environmental condition in the storm drain (102, 104) from the at least one sensor (106, 108, 110, 112, 114) to the sub node (116, 118),

arranging (212) the sub node (116, 118) in communication with a main node (120),

transmitting (214) data regarding the determined environmental condition in the storm drain (102, 104) from the sub node (116, 118) to the main node (120),

arranging (216) the main node (120) to process the data received in order to monitor the environmental condition in the storm drain (102, 104).

11. Method (200) according to claim 10, the method further comprising,

arranging at least one external sensor (122, 124) outside the storm drain (102, 104),

determining an environmental condition outside the storm drain (102, 104), andarranging the at least one external sensor (122, 124) arranged outside the storm drain (102, 104) in communication with the main node (120), the communication being direct from the external sensor (122, 124) outside the storm drain (102, 104) to the main node (120) or indirect to the main node (120) by means of a sub node (116, 118).

12. Method (200) according to claim 10 or 11, the method further comprising,

arranging the main node (120) in communication with at least one remote resource (126, 127).

13. Method (200) according to claim 11 or 12, the method further comprising,

providing at least one additional storm drain (104) containing a filter device (134) comprising a filter unit (130) and a floating carrier (132) for carrying the filter unit (130),

arranging at least one additional sensor (112, 114) in the at least one additional storm drain (104),

determining an environmental condition in the at least one additional storm drain (104) using the at least one additional sensor (112, 114),

arranging the at least one additional sensor (112, 114) in communication with an additional sub node (118),

transmitting data regarding the determined environmental condition in the at least one additional storm drain (104) from the at least one additional sensor (112, 114) to the additional sub node (118),

arranging the additional sub node (118) in communication with the main node (120),

transmitting data regarding the determined environmental condition in the at least one additional storm drain (102, 104) from the additional sub node (116, 118) to the main node (120),

transmitting data regarding the determined environmental condition outside the storm drain from the at least one external sensor (122, 124) arranged outside the storm drain (102, 104) to the main node (120),

determining by means of the main node (120), based on the determined environmental condition outside the storm (102, 104), an expected range for the determined environmental condition in the storm drain (102) and an expected range for the determined environmental condition in the at least one additional storm drain (104),

comparing by means of the main node (120), the determined environmental condition in the storm drain (102) and the determined

environmental condition in the at least one additional storm drain (104) with the expected ranges respectively,

generating a signal by means of the main node (120) if the determined environmental condition in the storm drain (102) or the determined environmental condition in the at least one additional storm drain (104) is determined not to be included in the expected ranges respectively, wherein the signal at least being indicative of which storm drain (102, 104) has a determined environmental condition not included in its expected range.

14. Method according to claim 13, the method further comprising,

storing the signal in the main node (120) or transmitting the signal from the main node to the at least one remote resource (126, 127).

15. Use of the system (100) according to any one of claims 1 – 10 for monitoring an environmental condition in a storm drain (102, 104).

CLAIMS

1. System (100) for monitoring an environmental condition in a storm drain (102, 104), the system comprising;

a storm drain (102, 104), containing a filter device (134) comprising a filter unit (130) and a floating carrier (132) for carrying the filter unit (130),

at least one sensor (106, 108, 110, 112, 114) arranged in the storm drain (102, 104), for determining an environmental condition in the storm drain (102, 104),

the at least one sensor (106, 108, 110, 112, 114) being arranged in communication with a sub node (116, 118) for transmitting data regarding the determined environmental condition in the storm drain (102, 104) to the sub node (116, 118),

the sub node (116, 118) being arranged in communication with a main node (120) for transmitting data regarding the determined environmental condition in the storm drain (102, 104) to the main node (120), and

at least one external sensor (122, 124) arranged outside the storm drain (102, 104), wherein the main node (120) is arranged in communication with at least one external sensor (122, 124) arranged outside the storm drain (102, 104) for determining an environmental condition outside the storm drain (102, 104),

the main node (120) being arranged to process the data received in order to monitor the environmental condition in the storm drain (102, 104).

2. System (100) according to claim 1, wherein the at least one sensor (106, 108, 110, 112, 114) is arranged in communication with the sub node (116, 118) by means of a radio frequency connection.

3. System (100) according to claim 1 or 2, wherein the at least one sensor (106, 108, 110, 112, 114) is arranged on the filter unit (130) of the filter device (134), on the floating carrier (132) of the filter device (134), or in the storm drain (102, 104) in a position separate from the filter device (134).

4. System (100) according to any one of the preceding claims, wherein the at least one sensor (106, 108, 110, 112, 114) is chosen from the group consisting of; a pressure sensor, a flow sensor, a temperature sensor, a humidity sensor, a light sensor, a gas sensor, a carbon dioxide sensor, an acceleration sensor, a hydro carbon sensor, an electrical field distribution sensor, and an electrical field penetration sensor.

5. System (100) according to any one of the preceding claims, wherein the sub node (116, 118) is arranged in communication with the main node (120) by means of a radio frequency connection.

6. System (100) according to any one of the preceding claims, wherein the main node (120) is arranged in communication with the at least one external sensor (122, 124) direct from the external sensor (122, 124) outside the storm drain (102, 104) to the main node (120) or indirect to the main node (120) by means of a sub node.

7. System (100) according to any one of the preceding claims, wherein the at least one external sensor (122, 124) arranged outside the storm drain is chosen from the group consisting of; a temperature sensor, an oxygen sensor, a carbon dioxide sensor, a moisture sensor, a light sensor, an acceleration sensor and a combustion gas sensor.

8. System (100) according to any one of the preceding claims, wherein the main node (120) is arranged in communication with at least one remote resource (126, 127).

9. System (100) according to claim 8, wherein the main node (120) is arranged in communication with the at least one remote resource (126, 127) by means of a radio frequency connection.

10. Method (200) for monitoring an environmental condition in a storm drain (102, 104), the method comprising;

providing (202) a storm drain (102, 104) containing a filter device (134) comprising a filter unit (130) and a floating carrier (132) for carrying the filter unit (130),

arranging (204) at least one sensor (106, 108, 110, 112, 114) in the storm drain (102, 104),

determining (206) an environmental condition in the storm drain (102, 104) using the at least one sensor (106, 108, 110, 112, 114),

arranging (208) the at least one sensor (106, 108, 110, 112, 114) in communication with a sub node (116, 118),

transmitting (210) data regarding the determined environmental condition in the storm drain (102, 104) from the at least one sensor (106, 108, 110, 112, 114) to the sub node (116, 118),

arranging (212) the sub node (116, 118) in communication with a main node (120),

transmitting (214) data regarding the determined environmental condition in the storm drain (102, 104) from the sub node (116, 118) to the main node (120),

arranging at least one external sensor (122, 124) outside the storm drain (102, 104),

determining an environmental condition outside the storm drain (102, 104),

arranging the at least one external sensor (122, 124) arranged outside the storm drain (102, 104) in communication with the main node (120), and

arranging (216) the main node (120) to process the data received in order to monitor the environmental condition in the storm drain (102, 104).

11. Method (200) according to claim 10, wherein the arranging the at least one external sensor (122, 124) arranged outside the storm drain (102, 104) in communication with the main node (120), being direct communication from the external sensor (122, 124) outside the storm drain (102, 104) to the main node (120) or indirect communication to the main node (120) by means of a sub node (116, 118).

12. Method (200) according to claim 10 or 11, the method further comprising,

arranging the main node (120) in communication with at least one remote resource (126, 127).

13. Method (200) according to claim 11 or 12, the method further comprising,

providing at least one additional storm drain (104) containing a filter device (134) comprising a filter unit (130) and a floating carrier (132) for carrying the filter unit (130),

arranging at least one additional sensor (112, 114) in the at least one additional storm drain (104),

determining an environmental condition in the at least one additional storm drain (104) using the at least one additional sensor (112, 114),

arranging the at least one additional sensor (112, 114) in communication with an additional sub node (118),

transmitting data regarding the determined environmental condition in the at least one additional storm drain (104) from the at least one additional sensor (112, 114) to the additional sub node (118),

arranging the additional sub node (118) in communication with the main node (120),

transmitting data regarding the determined environmental condition in the at least one additional storm drain (102, 104) from the additional sub node (116, 118) to the main node (120),

transmitting data regarding the determined environmental condition outside the storm drain from the at least one external sensor (122, 124) arranged outside the storm drain (102, 104) to the main node (120),

determining by means of the main node (120), based on the determined environmental condition outside the storm (102, 104), an expected range for the determined environmental condition in the storm drain (102) and an expected range for the determined environmental condition in the at least one additional storm drain (104),

comparing by means of the main node (120), the determined environmental condition in the storm drain (102) and the determined environmental condition in the at least one additional storm drain (104) with the expected ranges respectively,

generating a signal by means of the main node (120) if the determined environmental condition in the storm drain (102) or the determined environmental condition in the at least one additional storm drain (104) is determined not to be included in the expected ranges respectively, wherein the signal at least being indicative of which storm drain (102, 104) has a determined environmental condition not included in its expected range.

14. Method according to claim 13, the method further comprising,

storing the signal in the main node (120) or transmitting the signal from the main node to the at least one remote resource (126, 127).

15. Use of the system (100) according to any one of claims 1 – 9 for monitoring an environmental condition in a storm drain (102, 104).