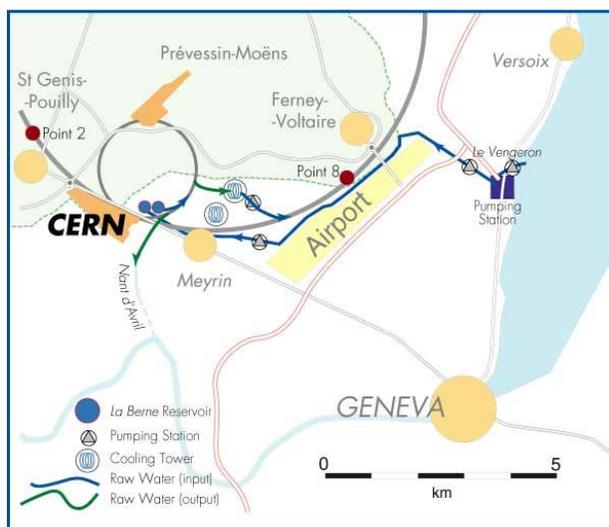


2014 CERN Water Consumption

The water is supplied to CERN from Lake of Geneva by a pumping station located in Vengeron (CH) by the Services Industriels de Genève (SIG). On some SPS Points (BA2, BA4) and on all the LHC Points, drinking water is supplied by the local French network for sanitary use and to ensure redundancy on the fire extinction network.



The total water consumption in 2014 amounted to around 3.7 Mm³ which is 3% higher than the one in 2013. In these two years CERN accelerators were not in operation and therefore several circuits run for a limited time and not at full power.

The water is mainly used on the CERN sites for cooling purposes or industrial usage as well as for sanitary installations. The resulting effluents, together with natural meteoric and infiltration waters are evacuated from the CERN sites in a controlled way.

Cooling water

The cooling water is either used as it is supplied (raw water), or is processed (demineralized water) and used in secondary circuits cooled by cooling towers using heat exchangers.

With the aim of keeping the water consumption low, the cooling water is circulated in closed loops that periodically require the addition of raw water to compensate for the evaporation in the cooling towers. Also, in case of excessive mineralization, the water in these circuits can be discharged and evacuated from the CERN site.

In addition, according to the legislation in force, water in the CERN atmospheric refrigerants is regularly checked for the Legionella and preventive treatments with biocides, respecting the applicable standards for water quality protection, are carried out.

The Water Distribution Network

Three pumping stations, all located in Point 1 of the LHC opposite to the main entrance, ensure most of the water distribution to all the CERN sites. These are:

1. The pumping station (P1) dedicated to the SPS and serving all technical equipment in the SPS and its surface buildings. This is a pure circulation pumping system, which during 2014 has circulated almost 11 Mm³ in the SPS; this represents half of the volume circulated in 2012 during the last year of physics run.
2. The pumping station (P2) is dedicated to the LHC and serves all the technical equipment in the LHC and its surface buildings. It pumps water made available by the Vengeron pumping station owned by the Service Industriels de Genève.
3. The pumping station (P3) is for the sanitary and technical needs in both the Meyrin and the Prévessin sites. Like the previous pumping station, it pumps water made available by the Vengeron pumping station owned by the Service Industriels de Genève.

In addition, the French (S4) and Swiss (S5) water distribution networks supply some of the SPS and LHC surface sites as detailed in the tables below.

SPS - 2014			Total
	Source	Origin	[m ³]
SPS BA2	S4	F	376
SPS BA4	S4	F	3'477

SPS BA5	S5	CH	34
Total			3'877

The water consumption in the SPS Points is for sanitary use only. The water to compensate for the evaporation in the cooling towers is given in the table for the water consumption of the Meyrin and Prévessin sites.

LHC - 2014			Total
	Source	Origin	[m ³]
LHC Complex	P2	CH	970'434
LHC Point 2	S4	F	6'048
LHC Point 3.2, 3.3	S4	F	396
LHC Point 4	S4	F	6'226
LHC Point 5	S4	F	5'413
LHC Point 6	S4	F	3'324
LHC Point 7	S4	F	0(*)
LHC Point 8	S4	F	6'574
Total			998'415

(*) Value not available

The water consumption for the LHC Complex is mainly used to compensate for the evaporation in the cooling towers of the LHC Points. The water consumption in the LHC Points, 26'995 m³ in total, is mainly for sanitary use and for backup of the surface network for the hydrants in case of fire. As during 2012, but for a more limited period of time, the water for LHC has been provided for extended periods by the WS NET given the very low demand on the LHC loop, and the corresponding volume, is not included in the above table.

The variations of water consumption in the LHC Points with respect to previous years or between two Points are mainly due to the number of people present on the sites, in particular in some of the Points the planned interventions for maintenance or works during LS1 have been quite limited. No major leaks have been observed during 2014 in these points.

Meyrin & Prévessin 2014			Total [m ³]
	Source	Origin	
Meyrin and Prévessin sites main supply, SPS BA1 and BA6, LHC Point 1	P3	CH	2'697'636
Safe supply	S5	CH	1'515
Clubs	S5	CH	1'148
Globe	S5	CH	1'085
Total			2'701'384

The first row of this table also includes the water to compensate for the evaporation in the cooling towers of the SPS. The consumption for the WN-NET is decreased with respect to 2013 since the supply of water to the LHC has been lower as explained previously; however if we compare the total consumption of the WS NET and the WS-LHC in 2013 and 2014, the volume is 0.1 Mm³ higher, value that represents almost all the increase of consumption between the two years for the whole CERN.

The campaign of renovation of small air conditioning units using drinking water as coolant have continued in 2014 allowing a yearly saving of a few tenth of thousands of cubic meters.