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WRR Team:**Confidential Note1**

Confidential Note No. 1 to Water Resource Review Report No. WRR/2022/202867 of Nestlé Waters France, Vosges Factory established by [REDACTED] and the team during the review from June 13th to 17th, 2022. The opinions expressed are not intended to be a definitive judgement on the legal interpretation. Note, the Water Resource Review chapter is delegated to the corresponding Nestlé Waters team as it requires specific expert knowledge.

Water Resources vs Quality**Water Resources vulnerability, contamination (Ref. ISS.20)****CRITICAL****Risk: Regulatory; reputational****External Compliance**

Vosges factory produces Vittel Grande Source, Hépar and Contrex Natural Mineral Waters (NMW). The finished products are safe to drink. However, water resource management and water treatment processes require full attention to comply with regulations and avoid reputational risks. Review of water resources usage and production processes showed the following:

Microbiological contamination of aquifers (see detailed findings)

For Hépar:

=> Presence in production wells of pathogens and Heterotrophic Plate Count (HPC) above legal limits for finished products, up to 85% (total coliforms in Essar well). The most impacted wells are HP Nord and Essar (respectively 10% and 50% of total Hépar).

=> The official raw water sampling points are equipped with filters of 0,2 µm for Essar (UV until June 2022) and 0,45 µm for Peulin – Ermitage – HP Nord

=> To ensure safe and compliant finished products, the water treatment backline for bottling all Hépar sources is protected with 0,2 µm filters – changed from UV and 0,45 µm filters in place until June 2022.

For Vittel Grande Source:

=> Sporadic presence of HPC in production wells above the legal limits set for finished products

=> The official raw water sampling point for GS Captage (60% of the total mix) is protected by 0,45 µm

=> The backline is protected by 0,45 µm to ensure safe finished products

Note: no pathogen is detected in the raw water

For Contrex:

=> Presence of HPC in all production wells above the legal limits for finished products

=> Presence of pathogens in Belle Lorraine and Thierry Lorraine production wells which represented 45% of the total mix.

Note: both wells Belle Lorraine and Thierry Lorraine have been stopped on November 28th, 2022 and authorities officially informed. Bottling permit to be updated accordingly – Discussion is ongoing with local authorities.

=> The backline is protected by 0,2µm and 0,45 µm to ensure safe finished products

The microbiological quality of the raw water (Hépar and Contrex) and the processes in place are not compliant with the French regulation on NMW (*Arrêté du 14 mars 2007 - Modifié par Arrêté du 10 janvier 2023*) which indicates that the source must be free of pathogens and the treatment cannot modify the microbiological and chemical characteristics of water

Note1: The microbiological contamination of water, the processes in place in the backline and the protection of the official raw water sampling points were shared with national (Health & Industry Ministries) and local (Agence Régionale de Santé) authorities in 2022.

The discussion has started in August 2021 and are still ongoing (ALPS/ANDES project).

Note2: The water treatment (microfilters) of Hépar is located in a remote building (the “Palmarium”), which is shared with the Vittel municipality and Vittel Invest. The microfilters have been installed in a separate room with all pipes feeding and returning from this treatment unit hidden in an underground room and crossing walls; they are very difficult to clean and lead to very frequent CIP attempts which are far from being successful. The design of CIP station at Palmarium does not allow cleaning and frequent sanitization of microfilters.

Chemical contamination of aquifers (see detailed findings):

For Hépar:

=> In Essar well (50% of the mix) presence of anthropogenic molecules below the legal limits

For Vittel Grande Source:

=> In GS captage (60% of the mix) presence of anthropogenic molecules below the legal limits

=> An active carbon filter was installed to remove these molecules (practice non-authorized by the law for NMW). This filter was disconnected in April 2022 and these molecules can now be detected in the finished product after dilution with the other GS wells.

For Contrex:

=> Presence in Thierry Lorraine of anthropogenic molecules but this well was stopped since 22/11/2022.

Note3: There is no regulatory incompliance nor food safety risk with the presence of these molecules in the finished products. Public survey done in the past in France on NMW bottled water quality by consumer associations (e.g. 60 millions de consommateurs) already reported detection of traces of those chemical molecules in GS products, showing a potential reputational exposure (versus original purity concept). A corresponding position paper has been worked out.

Note4: On-going remediation action plan is pending until authorities' validation (see detailed findings).

Root Cause: Aquifers vulnerability

Detailed findings:

Vosges factory produces Vittel Grande Source, Vittel Bonne Source, Hépar and Contrex Natural Mineral Waters (NMW). Water resource management and water treatment processes require full attention to comply with regulations and avoid reputational risks. One exception is Vittel Bonne Source which is really well protected in a deep confined aquifer.

Review of water resources usage and production processes showed the following:

1) Microbiological contamination of aquifers:

For Hépar:

=> Presence of pathogens in production wells (Coliforms, E. Coli, Pseudomonas aeruginosa, Enterococcus) and Heterotrophic Plate Count (HPC) above legal limits for finished products (absence for pathogens and 100 cfu/ 1ml at 22°C and 20 cfu/ 1ml at 36°C for HPC)

=> The most impacted wells are HP Nord and Essar, representing respectively 10% and 50% of the total mix of Hépar

=> The official sampling points for Essar was protected by UV (changed to 0,2 µm since June 2022) and by 0,45 µm for Peulin – Ermitage – HP Nord

=> The backline was protected by UV and 0,45 µm for all to ensure safe and compliant finished products (currently by 0,2 µm)

Hépar two years microbiological monitoring showed:

January 2020 - March 2022

Sampling point		Sampling point description	Total Coliforms (cfu/250 ml)				E.Coli (cfu/250 ml)			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% presence	Min (cfu)	Max (cfu)
HEPAR	HEPAR CHAMOIS FORAGE	V230-HPC-HEPAR CHAMOIS FORAGE	1xweek	1,50%	<1 cfu	2 cfu	1xweek	0,00%	<1 cfu	<1 cfu
	Forage HP Nord Brut	V236-EV21 MUTINSH	1xweek	62,50%	2 cfu	100 cfu	1xweek	5,12%	<1 cfu	3 cfu
	Essar Brut	V241-EV1 HIPPOE	1xweek	85,70%	1 cfu	100 cfu	1xweek	14,30%	1 cfu	100 cfu
	Arrivée Nord et Chamois Brut - Palmarium	V48-EV13 SNCFH	1xweek	52,30%	1 cfu	100 cfu	1xweek	2,90%	1 cfu	6 cfu
	Ermitage Brut (Palmarium arrival)	V491-EV20 HOTEL	1xweek	0,00%	<1 cfu	< 1 cfu	1xweek	0,00%	<1 cfu	< 1 cfu
	Peulin Brut (Palmarium arrival)	V49-EV14 GOLF	1xweek	1,90%	<1 cfu	1 cfu	1xweek	1,90%	<1 cfu	1 cfu

Sampling point		Sampling point description	Sulfite-Reducing Anaerobic Spores (cfu/50 ml)				HPC22°C 1 ml				HPC36°C 1ml			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% > 100 cfu	Min (cfu)	Max (cfu)	Frequency of analysis	% > 20 cfu	Min (cfu)	Max (cfu)
HEPAR	HEPAR CHAMOIS FORAGE	V230-HPC-HEPAR CHAMOIS FORAGE	1xmonth	0,00%	<1	<1	1xweek	24,00%	<1 cfu	300 cfu	1xweek	0,90%	<1	44
	Forage HP Nord Brut	V236-EV21 MUTINSH	-	-	-	-	1xweek	27,50%	<1 cfu	300 cfu	-	-	-	-
	Essar Brut	V241-EV1 HIPPOE	1xweek from 25 of May 2021	0,00%	< 1	< 1	1xweek	13,00%	<1 cfu	300 cfu	-	-	-	-
	Arrivée Nord et Chamois Brut - Palmarium	V48-EV13 SNCFH	-	-	-	-	1xweek	11,60%	<1 cfu	300 cfu	-	-	-	-
	Ermitage Brut (Palmarium arrival)	V491-EV20 HOTEL	-	-	-	-	1xweek	0,00%	< 1cfu	< 1cfu	-	-	-	-
	Peulin Brut (Palmarium arrival)	V49-EV14 GOLF	-	-	-	-	1xweek	48,00%	< 1cfu	429 cfu	-	-	-	-

Sampling point		Sampling point description	P.A (cfu/250 ml)				Enterococcus (cfu/250 ml)			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% presence	Min (cfu)	Max (cfu)
HEPAR	HEPAR CHAMOIS FORAGE	V230-HPC-HEPAR CHAMOIS FORAGE	1xmonth	0,00%	<1 cfu	<1 cfu	1xmonth	0,00%	<1 cfu	<1 cfu
	Forage HP Nord Brut	V236-EV21 MUTINSH	-	-	-	-	-	-	-	-
	Essar Brut	V241-EV1 HIPPOE	1xweek from 25 of May 2021	3,30%	<1	18	1xweek from 25 of May 2021	16,60%	2	15
	Arrivée Nord et Chamois Brut - Palmarium	V48-EV13 SNCFH	-	-	-	-	-	-	-	-
	Ermitage Brut (Palmarium arrival)	V491-EV20 HOTEL	-	-	-	-	-	-	-	-
	Peulin Brut (Palmarium arrival)	V49-EV14 GOLF	-	-	-	-	-	-	-	-

For Vittel Grande Source:

=> Sporadic presence of HPC in production wells above the legal limits for finished products

=> The official sampling point for GS Captage (60% of the total mix) is protected by 0,45 µm

=> The backline is protected by 0,45 µm to ensure safe finished products

Note: no pathogen is detected in the raw water

Grande Source two years microbiological monitoring showed:

January 2020 - March 2022

Sampling point	Sampling point description	HPC22°C 1 ml				HPC36°C 1ml				
		Frequency of analysis	% > 100 cfu	Min (cfu)	Max (cfu)	Frequency of analysis	% > 20 cfu	Min (cfu)	Max (cfu)	
GRAND SOURCE	GS Bois	V86-GSBFAM-GS Bois arrivée 1000m3	1xday	12,70%	< 1 cfu	300 cfu	1xday	24,70%	< 1 cfu	300 cfu
	GS Chatillon	V87-GSCFAM-GS Chatillon arrivée 1000m3	1xday	26,90%	< 1 cfu	300 cfu	1xday	0,00%	< 1 cfu	12 cfu
	GS Est	V88-GSEFAM-GS Est arrivée 1000m3	1xday	1,41%	< 1 cfu	300 cfu	1xday	3,25%	< 1 cfu	41 cfu
	GS Sud Forage	V90-GSSFAM-GS Sud Forage Arrivée 1000M3	1xday	26,60%	< 1 cfu	300 cfu	1xday	1,60%	< 1 cfu	87 cfu
	Thermes Captage	V51-EV16 THERMESGC	1xweek	0,00%	< 1 cfu	< 1 cfu	-	-	-	-
	V91-GSSMAB-GS Chatillon+GS Bois 1000m3	Mixing point	1xday	0,00%	< 1 cfu	2 cfu	1xday	14.9%	< 1 cfu	300 cfu

	Sampling point	Sampling point description	Total Coliforms (cfu/250 ml)				E.Coli (cfu/250 ml)			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% presence	Min (cfu)	Max (cfu)
GRAND SOURCE	GS Bois	V86-GSBFAM-GS Bois arrivée 1000m3	1xday	0,00%	< 1 cfu	< 1 cfu	1xday	0,00%	< 1 cfu	< 1 cfu
	GS Chatillon	V87-GSCFAM-GS Chatillon arrivée 1000m3	1xday	0,00%	< 1 cfu	< 1 cfu	1xday	0,00%	< 1 cfu	< 1 cfu
	GS Est	V88-GSEFAM-GS Est arrivée 1000m3	1xday (Tuesday-Friday)	0,00%	< 1 cfu	< 1 cfu	1xday (Tuesday-Friday)	0,00%	< 1 cfu	< 1 cfu
	GS Sud Forage	V90-GSSFAM-GS Sud Forage Arrivée 1000M3	1xday	0,00%	< 1 cfu	< 1 cfu	1xday	0,00%	< 1 cfu	< 1 cfu
	Thermes Captage	V51-EV16 THERMESGC	1xweek	0,00%	< 1 cfu	< 1 cfu	1xweek	0,00%	< 1 cfu	< 1 cfu
	Mixing point GS Chantillon + GS Bois	Mixing point	1xday	0,00%	< 1 cfu	< 1 cfu	1xday	0,00%	< 1 cfu	< 1 cfu

	Sampling point	Sampling point description	P.A (cfu/250 ml)			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)
GRAND SOURCE	GS Bois	V86-GSBFAM-GS Bois arrivée 1000m3	1xday	0,00%	<1 cfu	<1 cfu
	GS Chatillon	V87-GSCFAM-GS Chatillon arrivée 1000m3	1xday	0,00%	<1 cfu	<1 cfu
	GS Est	V88-GSEFAM-GS Est arrivée 1000m3	1xday (Tuesday-Friday)	0,00%	< 1 cfu	< 1 cfu
	GS Sud Forage	V90-GSSFAM-GS Sud Forage Arrivée 1000M3	1xweek	0,00%	< 1 cfu	< 1 cfu
	Thermes Captage	V51-EV16 THERMESGC	-	-	-	-
	V91-GSSMAB-GS Chatillon+GS Bois 1000m3	Mixing point	-	-	-	-

For Contrex:

=> Presence of HPC in all production wells above the legal limits for finished products

=> Presence of pathogens in Belle Lorraine and Thierry Lorraine production wells (Coliforms, E. Coli) which represented 45% of the total mix (wells have been stopped on 2022, 28th of November – authorities have been officially informed but bottling authorization to be updated accordingly)

=> The official sampling points for Belle Lorraine and Thierry Lorraine wells were protected respectively by 0,45 µm and UV. Both wells have been stopped.

=> The backline is protected by 0,2µm and 0,45 µm to ensure safe finished products

Contrex two years microbiological monitoring showed:

January 2020 - March 2022

	Sampling point	Sampling point description	Total Coliforms (cfu/250 ml)				E.Coli (cfu/250 ml)			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% presence	Min (cfu)	Max (cfu)
Contrex	GREAT SOURCE FORAGE	C03-GREAF-GREAT SOURCE FORAGE	1xweek	0,00%	<1 cfu	< 1cfu	1xweek	0,00%	<1 cfu	< 1cfu
	Belle Lorraine forage Brut	C47-EC1 CHEVREUSE	1xweek	73,80%	1 cfu	100 cfu	1xweek	7,80%	1 cfu	16 cfu
	Thierry Lorraine forage Brut	C48-EC2 MANDRES	1xweek	6,80%	1 cfu	12 cfu	1xweek	0,00%	< 1 cfu	< 1 cfu
	Anger Lorraine	C49-F99.5-ANGER LORRAINE FORAGE	1xweek	0,00%	< 1 cfu	< 1 cfu	1xweek	0,00%	< 1 cfu	< 1 cfu
	Anger Lorraine + Belle Lorraine Brut *	C69-EC4 ANGER3	1xweek	42,40%	1 cfu	31 cfu	1xweek	2,00%	1 cfu	9 cfu
	REINE LORRAINE ARRIVEE TURBIL	C05-REILAT-REINE LORRAINE ARRIVEE TURBIL	1xday	0,00%	<1 cfu	< 1 cfu	1xday	0,00%	<1 cfu	< 1 cfu
	C10-CXTC13-CTX TURBIL 3 CUVE C13 DEPART*	Thierry Lorraine + Reine Lorraine + Great Source	1xweek	0,00%	<1 cfu	< 1 cfu	1xweek	0,00%	<1 cfu	< 1 cfu

* Mixing point before any treatment

	Sampling point	Sampling point description	P.A (cfu/250 ml)				Enterococcus (cfu/250 ml)			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% presence	Min (cfu)	Max (cfu)
Contrex	GREAT SOURCE FORAGE	C03-GREAF-GREAT SOURCE FORAGE	1xmonth	0,00%	<1 cfu	< 1 cfu	1xmonth	0,00%	<1 cfu	< 1 cfu
	Belle Lorraine forage Brut	C47-EC1 CHEVREUSE	-	-	-	-	-	-	-	-
	Thierry Lorraine forage Brut	C48-EC2 MANDRES	-	-	-	-	-	-	-	-
	Anger Lorraine	C49-F99.5-ANGER LORRAINE FORAGE	1xmonth	0,00%	<1 cfu	< 1 cfu	1xmonth	0,00%	<1 cfu	< 1 cfu
	Anger Lorraine + Belle Lorraine Brut *	C69-EC4 ANGER3	-	-	-	-	-	-	-	-
	REINE LORRAINE ARRIVEE TURBIL	C05-REILAT-REINE LORRAINE ARRIVEE TURBIL	1xweek + 1xday	0,00%	<1 cfu	< 1 cfu	-	-	-	-
	C10-CXTC13-CTX TURBIL 3 CUVE C13 DEPART*	Thierry Lorraine + Reine Lorraine + Great Source	1xweek	0,00%	<1 cfu	< 1 cfu	-	-	-	-

* Mixing point before any treatment

	Sampling point	Sampling point description	Sulfite-Reducing Anaerobic Spores (cfu/50 ml)				HPC22°C 1 ml				HPC36°C 1ml			
			Frequency of analysis	% presence	Min (cfu)	Max (cfu)	Frequency of analysis	% > 100 cfu	Min (cfu)	Max (cfu)	Frequency of analysis	% > 20 cfu	Min (cfu)	Max (cfu)
Contrex	GREAT SOURCE FORAGE	C03-GREAF-GREAT SOURCE FORAGE	1xmonth	0,00%	<1 cfu	< 1 cfu	1xweek	32,35%	<1 cfu	300 cfu	1xweek	0,00%	<1 cfu	19 cfu
	Belle Lorraine forage Brut	C47-EC1 CHEVREUSE	-	-	-	-	1xweek	10,50%	1 cfu	300 cfu	-	-	-	-
	Thierry Lorraine forage Brut	C48-EC2 MANDRES	-	-	-	-	1xweek	0,00%	<1 cfu	27 cfu	-	-	-	-
	Anger Lorraine	C49-F99.5-ANGER LORRAINE FORAGE	1xmonth	0,00%	<1 cfu	< 1 cfu	1xweek	11,60%	<1 cfu	300 cfu	1xweek	42,70%	<1 cfu	300 cfu
	Anger Lorraine + Belle Lorraine Brut	C69-EC4 ANGER3	-	-	-	-	1xweek	17,14%	<1 cfu	300 cfu	-	-	-	-
	REINE LORRAINE ARRIVEE TURBIL	C05-REILAT-REINE LORRAINE ARRIVEE TURBIL	-	-	-	-	1xday	12,86%	1 cfu	300 cfu	1xday	13,83%	<1 cfu	272 ufc
	C10-CXTC13-CTX TURBIL 3 CUVE C13 DEPART	Thierry Lorraine + Reine Lorraine + Great Source	-	-	-	-	1xday	1,98%	1 cfu	256 cfu	1xday	1,45%	<1 cfu	80 cfu

* Mixing point before any treatment

The microbiological quality of the raw water (Hépar and Contrex) and the processes in place are not compliant with the French regulation on NMW (*Arrêté du 14 mars 2007 - Modifié par Arrêté du 10 janvier 2023*) which indicates that the source must be free of pathogens (*A l'émergence et au cours de leur commercialisation, les eaux doivent être exemptes de germes témoins de contamination fécale, de parasites et de microorganismes pathogènes*) and the treatment cannot modify the microbiological and chemical characteristics of water (*Ces traitements ou adjonctions ne doivent pas modifier la composition de l'eau minérale naturelle dans ses constituants essentiels ni avoir pour but de modifier les caractéristiques microbiologiques de l'eau*).

Note1: The microbiological contamination of water, the processes in place in the backline and the protection of the official sampling points were shared with national (Health & Industry Ministries) and local (Agence Régionale de Santé) authorities in 2022.

The discussion has started in August 2021, and are still ongoing (ALPS/ANDES project).

Note2: The water treatment (microfilters) of Hépar is located in a remote building (the "Palmarium"), not 100% owned by Nestlé (+Vittel town & Vittel Invest). The microfilters have been installed in a separate room with all pipes feeding and returning from this treatment unit hidden in an underground room and cross walls; they are very difficult to clean and lead to very frequent CIP attempts which are far from being successful.

The CIP station at Palmarium has not been designed to clean and frequently sanitize microfilters:

1) the boiler is too small, requiring almost a complete 8 hours shift to heat up and 2 shifts to disinfect the full filtration unit of Essar+Bois.

2) the industrial water feeding the CIP system (TH0 water) is not sterilized (neither with 0.2 µm filter nor with UV), which has already caused ineffective cleanings leading to off-odor issues.

This is becoming highly critical after the removal of the UV at Essar well, replaced by a system of 4 filtration units, which have been declared to local authorities.

CIP of the Water Treatment of Contrexville:

Similarly, to Bonne Source and Grande Source, Contrex water treatment is not hot-water-sanitizable (with the exception of a small portion).

It is not located in the same building as the other BS & GS treatments.

2) Chemical contamination of aquifers (see detailed findings):

For Hépar:

=> In Essar well (50% of the mix) presence of anthropogenic molecules:

- Chlorothalonil M4=> 46 ng/l + other pesticide metabolites (below the legal limit sum = 100 ng/l)
- Sweeteners acesulfame 83 ng/l (no legal limit)
- Perfluoroalkyl (PFAS) substances sum = 2.52 ng/l (below the legal limit 30 ng/l)

For Vittel Grande Source:

=> In GS captage (60% of the mix) presence of anthropogenic molecules:

- Chlorothalonil M4=> 46 ng/l + 2-hydroxy atrazine 10-20 ng/l + other pesticide metabolites (sum just below the legal limit 100 ng/l)

=> An activated carbon filter was installed on this well in the past to remove these molecules (practice non-authorized by the law for NMW). This filter is disconnected since April 2022, so these molecules are in the finished products after dilution with the other GS wells and can be detected.

For Contrex:

=> Presence in Thierry Lorraine of pesticides, PFAS and BAM but this well was proactively stopped since 22/11/2022.

Note:

Chlorothalonil M4 was classified by the Agence Nationale de Sécurité Sanitaire de l'alimentation, de l'environnement et du travail (ANSES) as relevant metabolite (Saisine n° « 2021-SA-0020-b » of 26/01/2022).

Note:

Ministry action plan was launched at national level in January 2023 on PFAS, which are becoming more and more sensible topic and ANSES is starting toxicological studies to determine the maximum limits to be respected in environment.

Note:

These molecules are in the finished products and can be detected. **This represents more a reputational risk (versus original purity concept) than regulatory and safety risks.**

The presence of these molecules is not shared with the authorities, but public survey done in the past in France on NMW bottled water quality by consumers association (ex: 60 millions de consommateurs) have already reported detection of traces of those chemical molecules in GS products. Position paper is ready to be used if needed.

Examples of chemical contamination of production wells:

Essar captage located near the Petit Vair river. Infiltration of surface water to the shallow aquifer is suspected:

Produit*	ESSAR CAPTAGE
Date de prélèvement*	21-mars-2022 14:00
Date de réception	21-mars-2022 15:00
Date de début des analyses	24-mars-2022
N° d'échantillon	710645
Valeurs supérieures aux spécifications*	Aucune spécification demandée
Composé organique trouvé	Acesulfame K : 83 ng/l Acide perfluorobutane sulfonique (PFBS) : 0.20 ng/l Acide perfluoroheptanoïque (PFHpA) : 0.27 ng/l Acide perfluorohexane sulfonique (PFHxS) : 0.76 ng/l Acide perfluorohexanoïque (PFHxA) : 0.31 ng/l Acide Perfluorooctane sulfonique (PFOS) : 0.16 ng/l Acide perfluorooctanoïque (PFOA) : 0.41 ng/l Acide perfluoropentanesulfonique (PFPS) : 0.15 ng/l Acide perfluoropentanoïque (PFPA) : 0.26 ng/l Chlorothalonil mét R471811 (M4) : 46 ng/l

Historical Grande Source Captage:

Produit*	GRANDE SOURCE CAPTAGE
Date de prélèvement*	07-nov.-2022 05:35
Date de réception	07-nov.-2022 10:00
Date de début des analyses	08-nov.-2022
N° d'échantillon	726708
Valeurs supérieures aux spécifications*	Aucune spécification demandée
Composé organique trouvé	2-hydroxy-atrazine : 17.9 ng/l Chlorothalonil mét R471811 (M4) : 46 ng/l Chlorothalonil mét SYN548008 (M3) : 22 ng/l

Thierry Lorraine used to produce Contrex (stopped in Nov 2022):

Produit*	THIERRY LORRAINE FORAGE
Date de prélèvement*	07-mars-2022 06:00
Date de réception	07-mars-2022 11:00
Date de début des analyses	03-oct.-2022
N° d'échantillon	709777
Valeurs supérieures aux spécifications*	Aucune spécification demandée
Composé organique trouvé	2,6-Dichlorobenzamide (BAM) : Presence Acide perfluorobutane sulfonique (PFBS) : 0.15 ng/l Acide perfluorobutanoïque (PFBA) : 2.64 ng/l Acide perfluoroheptanoïque (PFHpA) : 0.78 ng/l Acide perfluorohexane sulfonique (PFHxS) : 0.12 ng/l Acide perfluorohexanoïque (PFHxA) : 4.22 ng/l Acide perfluoropentanoïque (PFPA) : 9.16 ng/l Métolachlore NOA 413173 : Presence

The ongoing remediation action plan is pending until authorities validation:**1) Proposed plan to give access to unprotected sampling points:**

Note: Before any action on protected sampling points, we will need to align with ARS on mandatory sampling protocols for NMW wells and how quality deviation will be managed by ARS and their dedicated lab (Eurofins).

=>Hépar:

- Remove protection (0,45 µm) of sampling points on 2 occasionally contaminated wells: Peulin and Ermitage.
- Remove protection (0,2 µm / 0,45 µm) of sampling points on 2 persistently contaminated wells: Essar et HP Nord - 2 wells have non protected sampling points: Hépar Bois– Hépar Chamoix
- Change production of Hépar to permanent product release status (done)

=>Vittel Grande Source:

- Remove protection (0,45 µm) of sampling point on GS Captage and create a new official sampling point directly at the well (not done). Current setup was presented to ARS in Nov during site visit. We showed them where is located the GS Captage sampling point that is not secured. No mandatory requirement from their side so far to change current design.
- All other sampling points are non-protected

=>Contrex:

- Proactively stop Belle Lorraine and Thierry Lorraine wells (done)
- Some work needed to by-pass / remove UV and replace by 0,2 µm (done)

=>Vittel Bonne Source:

- The sampling point is non-protected

2) Removal of non-authorized equipment in the backline:**=>Hépar:**

- Remove UV on Essar well (done) + replace 0,45 µm filter by 0,2 µm (still not authorized) at Palmarium (done)
- Install new micro-filtration set-up at Palmarium room for Essar/Bois backline (done) and define brief for the 4 other wells set-up (not done)

=>Vittel Grande Source:

- Remove activated carbon filter (GAC) on GS captage (done)
- Install a flowmeter at the well (done) + relocate micro-filtration from NASA to 1000 m3 area + define required micro-filtration design (not done)

=>Contrex:

- Stop UV protection on piping and rely only on 0,45 µm (0,2 µm if possible) done
- Later redesign backline if needed while removing UV equipment (2023+)
- Stop Belle Lorraine and Thierry Lorraine wells (the most impacted - done) with modification of WR licenses (not done)

=>Vittel Bonne Source:

- Production is stopped since 2022, June 1st and will restart in March 2023
- CO2 blanketing process part not identified as gap by ARS: study backline design adaptation to volumes decreases (incl. pump change) + CO2 blanketing removal (with NPTC support)

3) Specific plan for Hépar to try to reduce / stop the aquifer contamination:

If NW obtains the derogation from local authorities to keep using in production the 2 sensitive wells (Essar and HP Nord) some works can be done to try to fix the contamination issue:

- Update the vulnerability study by ANTEAGROUP (end of Feb 2023), to be shared with the Préfet in March 2023
- Launch a detailed vulnerability study in 500 m radius around Essar and HP Nord wells including horses centre and Hippodrome (geophysics, advanced chemical and microbiological analysis) - Q4 2023
- Launch a study to improve waterproofness of concrete plates in Petit Vair riverbed (installed in 70's) to minimize infiltration of contaminated surface water into the shallow mineral aquifer system (2023/2024 - CAPEX needed)
- Launch with support of the authorities a project initiated by Vittel town to connect the remaining 600 households to the sewage system in order to improve water quality of Petit Vair river. Budget according to Mayor is around 42M€. NW is ready to contribute financially to this project if approved. Collect facts to support the needs for this action.
- Implement a regulation of Essar flowrate based on Petit Vair level (Q4 2023)
- Implement a solution to review microbiological data of Essar in real time (Bactosense technology) to adjust practices (ongoing with NPTC support)
- Approve CAPEX for remediation plan and execute action plan based on ANTEAGROUP studies – 2023/2025
- Organize every 6 months an update for ARS – 2023/2025
- Start a work stream to switch Hépar to Drinking Water category re-doing clinical studies (3 years duration) in case the remediation plan is not successful after 3 years.

Action plan specific to the WT:

Hépar

- Short term = by-pass these long pipes and go straight and as short as possible from the filters to the buffer tanks
- Mid-term =
 - 1) relocate the whole treatment at the factory, close to the treatments of the other brands in the “1000 m3 room”, and close this Palmarium house.
 - 2) build here a new CIP station according to the NPTC standard with an adequately sized boiler, as well as a new industrial water treatment with adequate sterilization means.

Not only this would improve the quality but it would enable an optimized use of the operators.

Important note: the Bonne Source & Grande Source water treatments are also located in this “1000 m3 room” and are not equipped with a CIP system too. This is a gap vs the standard (WOS requirement #521).

In case of external microbiological contamination, there is no possibility to disinfect the media filters (sand and MnO₂). Therefore, the CIP station has to be installed there and adequately sized to be able to clean and disinfect these 3 treatment units.

Contrex:

Install a dedicated and adequately sized boiler and cleaning system.

Recommendation(s)

Recommendation	Agreement	Responsible	Timeline
Short term mitigation action plan:			
1. Finalize the proposed plan to remove all the sampling point protections in the backline to give access to the raw water after agreement with Health Authorities (ARS)	Agree	Factory Manager	2023-12-31
2. Remove all the non-authorized equipment in the backline (UV)	Agree	Factory Manager	2022-11-30
3. Put in place the appropriate microfiltration steps in the backline to protect the finished products after validation from authorities (and continue viruses monitoring)	Agree	Factory Manager	2023-12-31
4. Continue to monitor the raw water quality (chemistry and microbiology). Perform early warning analysis packs in all production wells where is not yet done. Consolidate all the data for better interpretation.	Agree	Factory Manager	2023-12-31
5. Update the vulnerability study focusing on Hépar area to identify potential sources of pollution and prepare a remediation plan.	Agree	Factory Manager	2023-12-31
6. Water Treatment: • By-pass the long deviation pipes in Hepar Palmarium and go straight and as short as possible from the filters to the buffer tanks (Done in February 2023). • Launch a CAPEX evaluation study to 1) move the whole Hepar water treatment to the 1000 m3 room, 2) install a dedicated system (sterile soft water + boiler) for effective CIP to be shared with Bonne Source and Grande Source treatments, and 3) install a boiler for CIP on Contrex water treatment	Agree	Factory Manager	2024-06-30
Mid-long-term mitigation action plan:			
7. Validate the new production wells F5 and F6 which have good water quality and adjust the mix with Grande Source Captage	Agree	Factory Manager	2025-12-31
8. Review the WR licenses according to new mix of Contrex	Agree	Factory Manager	2023-12-31
9. Launch a study to improve waterproofness of concrete plates in Petit Vair riverbed to minimize infiltration of contaminated surface water into the shallow mineral aquifer system of Hépar	Agree	Factory Manager	2023-12-31
10. If approved by authorities, support a project initiated by Vittel town to connect the remaining 600 households to the sewage system in order to improve water quality of Petit Vair. And get necessary CAPEX approved to financially support the initiative	Agree	Factory Manager	2023-12-31

11. Continue the WR investigation to try to find additional clean water for Hépar performing geophysical survey and new exploration wells.	Agree	Factory Manager	2025-12-31
12. Implement a regulation of Essar flowrate based on Petit Vair water level and a solution to get microbiological data of Essar in real time (Bactosense technology) to adjust the flowrate vs quality.	Agree	Factory Manager	2023-06-30
13. WT / CIP: execute the plan of point #6 if CAPEX approved	Agree	Factory Manager	2025-12-31
14. Start a work stream to switch Hépar to Drinking Water re-doing clinical studies (3 years duration) in case the remediation plan is not successful after 3 years	Agree	Factory Manager	2023-12-31
Management Comment	Agree with findings. Comments: This topic is already followed in ALPS/ANDES project.		