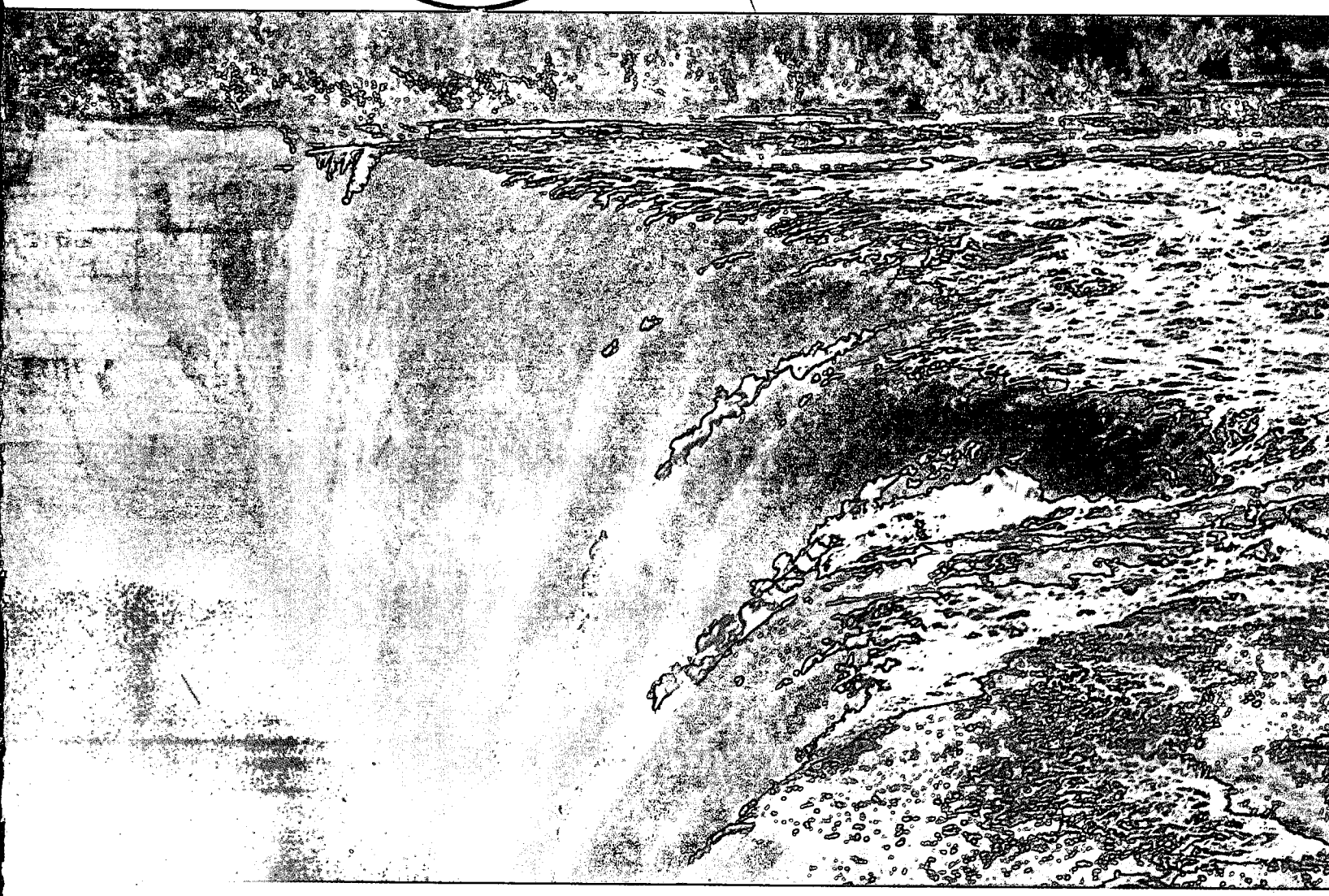
Environment Canada Environnement Canada

The Canadian Network for Sampling Organic Compounds in Precipitation

Réseau canadien d'échantillonnage des composés organiques des précipitations

P. Brooksbank



TECHNICAL BULLETIN NO. 129

ÉTUDE N° 129, COLLECTION DES RAPPORTS TECHNIQUES

INLAND WATERS DIRECTORATE
WATER QUALITY BRANCH
OTTAWA, CANADA, 1983

DIRECTION GÉNÉRALE DES EAUX INTÉRIEURES
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Illustrations

Figure 1. Lieux d'échantillonnage CANSOC . . . 2
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Abstract

Precipitation samples were collected at 12 locations across Canada and analyzed for the levels of several organochlorine pesticides and PCBs. The samples were collected using an automatic wet only collector. A number of problems were identified with the sampler and sampling technique, so that the data obtained have only a qualitative value. However, the data probably represent minimum values and do indicate the atmospheric transport of these compounds to remote areas. Recommendations for the development of an improved sampler are given.

Résumé

Des échantillons de précipitations ont été recueillis en douze endroits répartis à travers le Canada et on en a déterminé les teneurs de plusieurs pesticides organochlorés et PCB. Les échantillons ont été obtenus à l'aide d'un échantillonneur de précipitations automatique. Divers problèmes touchant l'échantillonneur et la technique d'échantillonnage ont fait que les données ne sont que qualitatives. On pense cependant qu'elles représentent probablement des valeurs minimales et indiquent un transport atmosphérique de ces composés vers des régions reculées. Des recommandations sont faites visant l'élaboration d'un échantillonneur amélioré.

The Canadian Network for Sampling Organic Compounds in Precipitation

Réseau canadien d'échantillonnage des composés organiques des précipitations

P. Brooksbank

INTRODUCTION

The discovery of environmental contamination in remote areas by synthetic organics gave the first indications of the importance of the atmospheric pathway for these contaminants. In fact, the contamination of water by trace amounts of PCBs and some other contaminants in lakes remote from non-atmospheric sources could only be accounted for by the atmospheric transport mechanism.

In 1966, Torrant and Tatton measured organochlorine residues in precipitation for various stations in the British Isles and found that the highest values often occurred in the more remote regions.

In Canada, the need of concern for the atmospheric transport pathway was verified when snow samples from the winter of 1975-76 and rain samples from the period May to November 1976 were collecteu from the Canadian side of the Great Lakes. All were examined for polychlorinated biphenyls and a range of organochlorine pesticides. The snow samples were time-integrated, being collected in February 1976. The rain samples were collected from seven locations on an event basis, using stainless steel samplers. Several complete events were collected, with the intervening dry-fall frequently included. Polychlorinated biphenyls, lindane, α-BHC, DDT residues, α-endosulfan and β-endosulfan, dieldrin and methoxychlor were frequently found with mean rain levels of 21, 5, 12, 3, 2, 1 and 8 ng/L, respectively. Concentrations in snowmelt were generally below the rain values, except for PCBs (Strachan and Huneault, 1979).

Murphy and Rzeszutko (1977) determined precipitation inputs of PCBs to Lake Michigan from event precipitation samples collected from November 1975 to October 1976. The average concentration of PCBs in rainfall was 138 ng/L. Further evidence of the atmospheric transport of organic contaminants was shown by Swain (1978), who during the period 1974 through 1976 studied the accumulation of selected persistent organic residues in fish species associated with the nearshore waters of Lake

INTRODUCTION

La découverte de la contamination de l'environnement par des composés organiques synthétiques dans des régions reculées a été le premier fait indiquant l'importance du transport aérien de ces contaminants. La contamination de lacs éloignés des sources de pollution non atmosphérique par des traces de PCB et d'autres contaminants ne pouvait s'expliquer que par un mécanisme de transport atmosphérique.

Après avoir déterminé, en 1966, les teneurs en organochlorés résiduels des précipitations recueillies à divers endroits des Iles britanniques, Torrant et Tatton ont remarqué que les teneurs les plus élevées étaient souvent notées dans les régions les plus éloignées.

Au Canada, l'importance du phénomène du transport atmosphérique a été révélée par des échantillons de neige prélevés au cours de l'hiver 1975-76 et des échantillons de pluie entre mai et novembre 1976; tous les échantillons provenaient du côté canadien des Grands lacs. Ils ont été analysés pour la présence de biphényles polychlorés et une gamme de pesticides organochlorés. Les échantillons de neige étaient intégrés dans le temps, car ils avaient été prélevés au cours du mois de février 1976. Les échantillons de pluie ont été recueillis en sept endroits par événement discret à l'aide d'échantillonneurs en acier inoxydable. Des échantillons ont été obtenus pour plusieurs périodes de précipitation et comprennent souvent la sédimentation sèche d'entre précipitations. La présence de PCB, de lindane, de α-HCB, de résidus de DDT, de α-endosulfan et de β-endosulfan, de dieldrine et du méthoxychlore a souvent été notée dans les échantillons de pluie, ceci à des teneurs respectives de 21, 5, 12, 3, 2, 1 et 8 ng/L. Les teneurs de l'eau de neige fondue étaient généralement inférieures, à l'exception des PCB (Strachan et Huneault, 1979).

Murphy et Rzeszutko (1977) ont déterminé les apports de PCB par précipitation au lac Michigan à partir d'échantillons discrets de précipitation recueillis de novembre 1975 à octobre 1976. La concentration moyenne

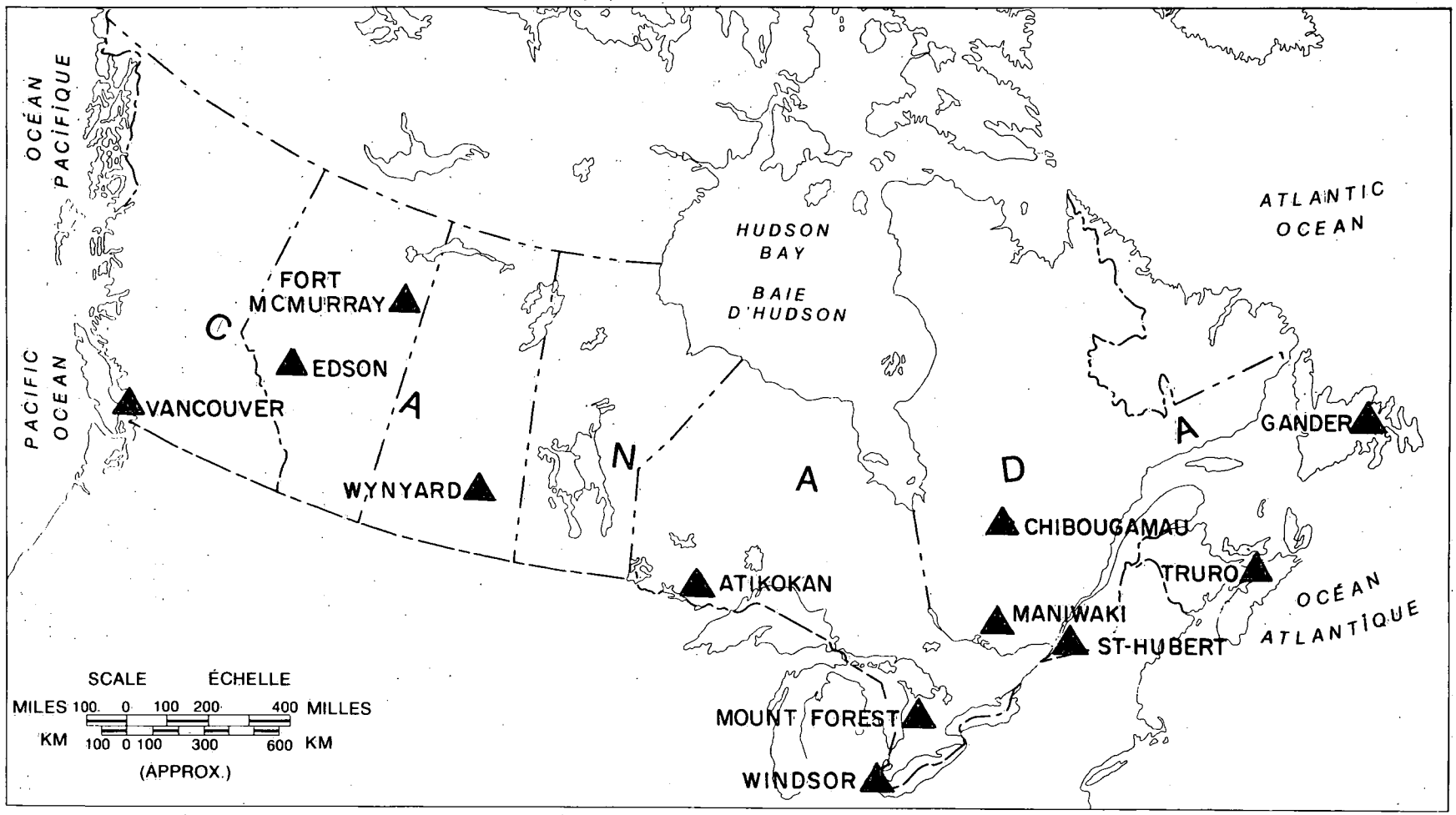


Figure 1. CANSOC sampling locations.

Figure 1. Réseau canadien d'échantillonnage des composés organiques des précipitations (CANSOC).

Superior. He reported PCB levels of 1.2 mg/kg (wet weight) in lake trout from Lake Siskwit, an interior lake on Isle Royale, Michigan, well removed from the direct influences of man.

In response to these findings, a precipitation chemistry network, CANSOC (Canadian Network for Sampling Organics in Precipitation), was established in 1977 by the Water Quality Branch (Davis and Scott, 1979) to examine precipitation across Canada for the existence and levels of several organochlorine pesticides and PCBs.

de PCB dans l'eau de pluie était de 138 ng/L. Une autre preuve du transport atmosphérique des contaminants organiques a été donnée par Swain (1978) qui a étudié, de 1974 à 1976, l'accumulation de résidus organiques persistants chez diverses espèces de poisson des eaux riveraines du lac Supérieur. Il a signalé des teneurs en PCB de 1.2 mg/kg (poids humide) chez des touladis du lac Siskwit, lac intérieur de l'Isle Royale, au Michigan, pourtant soustraite à l'influence directe de l'homme.

Tout ceci a amené la création, en 1977, du Réseau canadien d'échantillonnage des composés organiques des précipitations (CANSOC) par la Direction de la qualité des eaux (Davis et Scott, 1979) dans le but d'étudier les précipitations à travers tout le Canada pour la recherche et le dosage de plusieurs pesticides organochlorés et du PCB.

SAMPLING SITES

The CANSOC network consists of 12 sampling sites distributed across Canada at key locations, as indicated in Figure 1 and Table 1. All the sampling sites are located at Atmospheric Environment Service (AES), Environment Canada, Surface or Upper Air Weather Stations. The sampling sites are generally located in rural or semi-urban environments. Complete meteorological data sets are available from all these sites, including precipitation amounts as measured by national standard gauges.

POINTS D'ÉCHANTILLONNAGE

Le réseau CANSOC comprend douze points d'échantillonnage répartis dans tout le Canada en des lieux clés indiqués à la figure 1 et au tableau 1. Tous ces points coïncident avec des stations météo de surface ou atmosphériques du Service de l'environnement atmosphérique (SEA) d'Environnement Canada. Les points d'échantillonnage sont généralement situés en milieux rural ou semi-urbain. On dispose de données météorologiques complètes pour tous ces points, dont l'importance quantitative des précipitations mesurées par des appareils standardisés au niveau national.

SAMPLE COLLECTORS

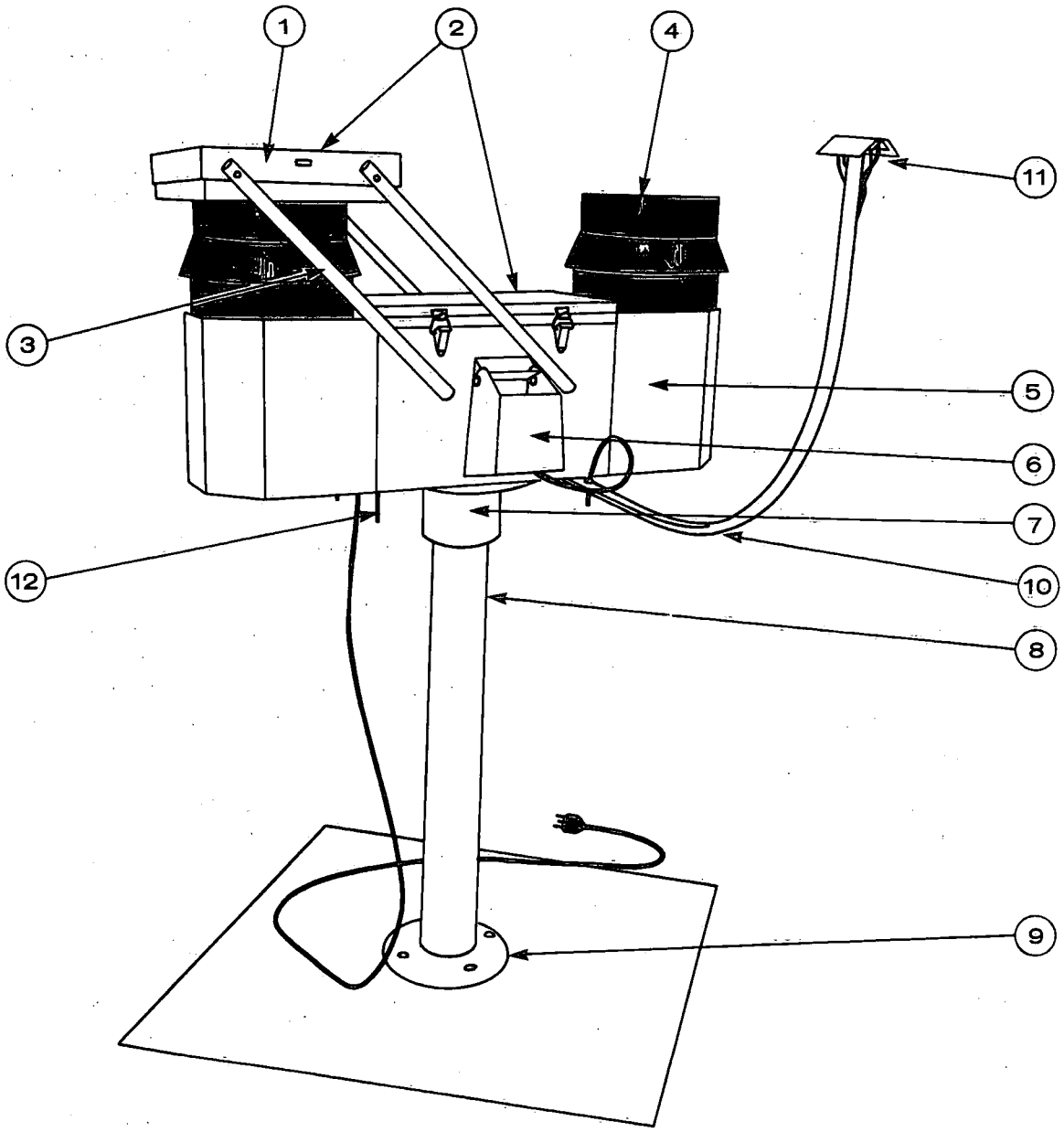
Each station in the network is equipped with a "modified" Sangamo Type A precipitation collector (Fig. 2). This is a "double bucket" collector; one bucket is used to collect precipitation only (wet deposition) and the other bucket can be used to collect dust samples (dry deposition). An automatic sensing system is used to detect precipitation, liquid or frozen. At the onset of a precipitation event, the sensor detects the precipitation and the cover is automatically moved from the "wet" bucket to the "dry" bucket. On cessation of the event the cover is automatically returned to the "wet" bucket.

The collection vessels used for sampling precipitation for organic contaminants are constructed of stainless steel. On the last day of each month, or if precipitation had occurred that day when the precipitation ceased, the sample was removed from the collector. The bucket was removed from the collector and transferred to a clean area, i.e., an area free from dust, gasoline, oil or any other material which could have contaminated the sample. If the sample was frozen, it was allowed to melt at room temperature before proceeding.

ÉCHANTILLONNEURS

On trouve à chaque station du réseau un collecteur de précipitations Sangamo de Type A «modifié» (fig. 2). Il s'agit d'un collecteur à deux augets, l'un sert à la collecte des précipitations «humides», l'autre à celle des poussières (sédimentation sèche). Un dispositif capteur automatique sert à la détection des précipitations, liquides ou gelées. Au début d'une précipitation, le capteur actionne le couvercle qui se déplace de l'auget «humide» à l'auget «sec». Le couvercle revient automatiquement à sa position initiale dès que la précipitation prend fin.

On utilise des récipients d'acier inoxydable pour la collecte des précipitations devant servir à l'étude des contaminants organiques. Le dernier jour de chaque mois, ou le jour d'une précipitation et après la fin de celle-ci, on retirait l'échantillon du collecteur. L'auget était retiré et transporté dans un endroit propre, c'est-à-dire exempt de poussières, d'essence, d'huile ou d'autres substances pouvant contaminer l'échantillon. Si l'échantillon était gelé, on le laissait dégeler à la température ambiante avant de le traiter.



1. MOVEABLE COVER / COUVERCLE MOBILE
2. SPLASH SCREENS / ÉCRANS ANTI-ÉCLABOUSSEMENT
3. COVER SUPPORT ARMS / SUPPORTS DE COUVERCLE
4. COLLECTION BUCKETS / AUGETS DE COLLECTE
5. HOUSING / ENVELOPPE
6. COVER PLATE / PLAQUE DE PROTECTION
7. MOUNTING FLANGE / BRIDE
8. MOUNTING PIPE (7.5 CM I.D.) / TUYAU DE SUPPORT (D.I. DE 7.5 CM)
9. COMPANION FLANGE (18 CM) / BRIDE (18 CM)
10. SENSOR HEAD SUPPORT ARM / SUPPORT DU CAPTEUR
11. SENSOR HEAD / CAPTEUR
12. HOUSING VENTS AND DRAIN SPOUTS / EVENTS ET ORIFICES DE DRAINAGE DE L'ENVELOPPE

Figure 2. Sangamo automatic precipitation sampler (Atmospheric Research Directorate, 1980). The black PVC collection buckets were replaced by rectangular stainless steel buckets for the investigation of organic compounds in precipitation.

Figure 2. Échantillonneur de précipitations automatique Sangamo. (Direction générale de la recherche atmosphérique, 1980). Les augets de collecte de PVC noir ont été remplacés par des augets d'acier inoxydable pour l'étude des composés organiques.

The sample was carefully transferred to a pre-cleaned glass bottle or bottles which were then capped tightly. The sample history form and sample identification label were completed. These, along with the sample, were then mailed directly to the Inland Waters Directorate Water Quality Branch Laboratory at the Canada Centre for Inland Waters in Burlington, Ontario, for chemical analysis.

About 1 L of sample was needed to perform a proper chemical analysis. For some stations samples were aggregated over periods of up to four months to obtain the necessary volume.

Les échantillons étaient transférés avec soin dans des bouteilles de verre propres qui étaient ensuite hermétiquement bouchées. On remplissait ensuite le formulaire de renseignements sur l'échantillon et l'étiquette d'identification. Le tout était ensuite expédié par la poste à la Direction générale des eaux intérieures, au laboratoire de la Direction de la qualité des eaux au Centre canadien des eaux intérieures de Burlington (Ontario) pour y subir l'analyse chimique.

Pour une analyse chimique appropriée, il fallait disposer d'un échantillon d'environ 1 L. Dans le cas de certaines stations, il a été nécessaire de réunir les échantillons obtenus au cours de périodes pouvant atteindre quatre mois afin d'obtenir le volume nécessaire.

CHEMICAL ANALYSIS

The samples were analyzed for the organochlorine pesticides and PCBs listed in Table 2, following the procedures described in the Water Quality Branch *Analytical Methods Manual*, 1979.

The samples were passed through an XAD-2 resin column which sorbs the organochlorinated pesticides and PCBs from natural waters. These organics were eluted from the resin column with diethyl ether followed by concentration using an evaporator. The organic extracts were cleaned and separated into four fractions by means of a high-speed liquid chromatograph. The separated fractions were then quantified by gas liquid chromatographic (GLC) analysis and, in some instances, the analyses were confirmed by mass spectrometric analysis.

ANALYSE CHIMIQUE

Les échantillons ont fait l'objet d'une analyse pour déceler la présence des pesticides organochlorés et des PCB mentionnés au tableau 2. Les méthodes utilisées ont été tirées du *Analytical Methods Manual* de la Direction de la qualité des eaux (1979).

Les échantillons ont été passés sur colonne de résine XAD-2 qui présente la caractéristique de sorber les pesticides organochlorés et les PCB à partir des eaux naturelles. Les matières organiques ont été éluées de la colonne au diéthyléther et concentrées par évaporateur. Les extraits organiques ont ensuite été nettoyés et séparés en quatre fractions par chromatographie liquide à haute vitesse. On a déterminé les teneurs respectives de chaque fraction par chromatographie gaz-liquide (CGL) et, dans certains cas, les résultats ont été confirmés par spectrométrie de masse.

RESULTS

The network became operational in April 1977 and samples were collected continuously until December 1980. However, during this period several instances of sampler malfunctions necessitated the return of the samplers for minor modifications. Consequently, there are some large gaps in the data set for some stations. In addition, the necessity of aggregating samples to provide sufficient volume for a proper chemical analysis resulted in shorter data sets, especially for stations in areas having a lower annual precipitation. The detailed results are given in the Appendix.

RÉSULTATS

Le réseau a pu être exploité à partir d'avril 1977 et des prélèvements ont été faits de façon continue jusqu'en décembre 1980. Il est cependant arrivé à plusieurs reprises que des échantillonneurs fonctionnent mal et il a fallu les retourner pour qu'ils subissent des réparations mineures. Les séries de données de certaines stations présentent donc des coupures importantes. La nécessité de réunir plusieurs échantillons afin d'obtenir des volumes suffisants pour l'analyse chimique s'est aussi traduite par des séries de données plus courtes, surtout pour les stations situées dans des zones de faibles précipitations annuelles. Les résultats sont présentés de façon détaillée à l'Annexe.

For several of the compounds under investigation the majority of the results were less than, equal to or slightly above the detection limit. Table 3 summarizes the results in terms of the percentage of analyses greater than or equal to the detection limit, which is indicated in the first column. The table shows that α-endosulfan, β-endosulfan, α-BHC, γ-BHC and p,p′ -DDT are frequently found in precipitation samples from all stations, indicating the widespread distribution of these compounds across Canada.

Dieldrin has been detected on a fairly frequent basis in the Prairies, Ontario and Quebec, although the levels detected are too close to the detection limit to be significant. Over the two-year period from 1978 to 1979, p,p′-methoxychlor was detected at significant levels, but only at stations in Ontario. The highest levels, 0.125 μg/L and 0.255 μg/L, were detected at Windsor, Ontario.

Polychlorinated biphenyls were detected frequently at stations in eastern Canada, particularly Saint-Hubert, Quebec, and Gander, Newfoundland. Levels of 50 ng/L were detected on two occasions at Gander. This may indicate a local problem.

Table 4 shows the distribution of alpha and gamma-BHC. These are the compounds detected most frequently. Generally, the mean values for the α-BHC concentrations are much larger than those for the γ-BHC. However, α-BHC has few or no insecticidal characteristics and occurs as a minor (less than 1%) impurity in lindane—an insecticide which contains predominantly γ-BHC. A mixed BHC product was last used in Canada in 1972, yet α-BHC is observed in surface waters, storm waters and precipitation on a wide geographic scale at levels higher than the γ-BHC form in the environment (Gummer, 1979). Gummer (1979) also reported on the widespread distribution of γ-BHC and α-BHC in surface waters of Western Canada. In that case the mean values for α-BHC concentrations were also larger than those for γ-BHC. He suggested that isomerization of γ-BHC to α-BHC in the environment may partially explain the higher than expected levels of α-BHC observed. Levels in the precipitation samples tend to be about an order of magnitude higher than those in the surface waters.

Other compounds found frequently are p,p′-DDT, and α-endosulfan and β-endosulfan. In the case of p,p′-DDT, the levels are rarely higher than the detection limit. For endosulfan, levels range from 1 to 30 ng/L for the beta isomer and 1 to 10 ng/L for the alpha isomer. The highest values are detected at Windsor and Vancouver.

Pour plusieurs produits étudiés, la majeure partie des valeurs obtenues variaient de inférieures à légèrement supérieures au seuil de détection. On trouvera (tableau 3) un résumé des résultats en fonction du pourcentage des résultats analytiques supérieurs ou égaux au seuil de détection, qui est indiqué dans la première colonne. On note dans le tableau que les α-endosulfan, β-endosulfan, α-HCB, β-HCB et p,p′-DDT se retrouvent souvent dans les échantillons de précipitations de toutes les stations, ce qui montre la distribution généralisée de ces composés partout au Canada.

La dieldrine a été assez fréquemment décelée dans les Prairies, l'Ontario et le Québec, mais les teneurs décelées sont trop près du seuil de détection pour être significatives. Le p,p′-méthoxychlore a été décelé, à des teneurs significatives, pendant la période de deux ans, soit 1978 et 1979, mais seulement dans certaines stations situées en Ontario. Les teneurs les plus élevées, celles de 0.125 μg/L et de 0.255 μg/L, ont été obtenues à Windsor (Ontario).

On a fréquemment décelé la présence de PCB dans des stations de l'est du pays, surtout à Saint-Hubert (Québec) et à Gander (Terre-Neuve). Des teneurs de 50 ng/L ont été notées à deux occasions à Gander et peuvent être indicatives d'une pollution locale.

On trouvera au tableau 4 la distribution des HCB alpha et gamma. Ces composés sont ceux qui ont été le plus fréquemment décelés. D'une façon générale les teneurs moyennes du α-HCB sont beaucoup plus importantes que celles du γ-HCB. Le α-HCB présente cependant très peu d'intérêt comme insecticide et constitue une impureté mineure (moins de 1 %) du lindane, insecticide qui contient surtout du γ-HCB. Même si la dernière utilisation au Canada du produit contenant les deux isomères remonte à 1972, on trouve cependant de l'α-HCB dans les eaux de ruissellement, les eaux pluviales et les précipitations sur de grandes superficies et ce, à des teneurs supérieures à celles de la forme γ-HCB dans l'environnement (Gummer, 1979). Gummer (1979) signale aussi la distribution généralisée des formes γ et α du HCB dans les eaux de surface de l'ouest du Canada et ici aussi les concentrations moyennes de la forme α-HCB étaient plus importantes que celles de la forme γ-HCB. Cet auteur suggère que l'isomérisation de la forme γ-HCB en la forme α-HCB dans l'environnement explique en partie les teneurs plus élevées de cette dernière. Les données notées dans les échantillons de précipitation tendent à être plus élevées d'un ordre de grandeur comparativement à celles des eaux de surface.

Les autres composés souvent décelés sont le p,p′-DDT et les α-endosulfan et β-endosulfan. Les teneurs de p,p′-DDT sont rarement supérieures au seuil de détection. Celles de

DISCUSSION

Before attempting to interpret and analyze these data, it is important to know their validity. This raises the question of the reliability of the sampling and the accuracy of the chemical analysis. Recent knowledge has indicated a number of inadequacies in both procedures (Eisenreich *et al.*, 1980).

In many cases, the present sampler does not collect a sufficient volume of precipitation over the collection period to permit an adequate chemical analysis. This has necessitated storage and compositing of samples for periods of up to four months, which greatly reduces the amount and usefulness of the data available for interpretation.

The wet removal of airborne trace organics from the atmosphere occurs by scavenging of particles and vapour partitioning in the atmosphere. The relative importance of these processes depends on the fraction of organics present as aerosol, particle-size distribution for particulates, and Henry's Law Constant (H) for vapour-phase partitioning. The physical properties of the compounds under investigation vary considerably in water solubility, vapour pressure, and in the affinity for association with particulate matter.

For some of the less soluble compounds, even if they are removed from the atmosphere by precipitation, it is highly probable that there will be remission to the atmosphere from the sample while it is in the sample container during the collection period (Mackay and Leinonen, 1975).

Precipitation, and more notably rain, is a very efficient scavenger of atmospheric particulate matter; thus precipitation samples in general have a relatively large particulate fraction. Present extraction techniques for organic chemical analysis do not efficiently extract compounds from the particulate matter (Coburn, 1981).

The CANSOC sampler and the sampling protocols used by the CANSOC network were designed to conform with the equipment and procedures in use by other existing networks in Canada at the time of inception. However, the other networks (the Canadian Network for Sampling Precipitation and the Great Lakes Precipitation Network) were designed to investigate precipitation for levels of inorganic parameters such as pH and major ions. When

l'endosulfan varient de 1 à 30 ng/L pour l'isomère bêta et de 1 à 10 ng/L pour l'isomère alpha. Les valeurs les plus élevées ont été notées à Windsor et à Vancouver.

DISCUSSION

Il est important, avant d'interpréter et d'analyser ces données, d'en connaître la validité. Cela soulève la question de la fiabilité de l'échantillonnage et de l'exactitude de l'analyse chimique. Des faits récents ont montré l'existence de plusieurs sources d'erreur dans ces deux domaines (Eisenreich et coll., 1980).

À plusieurs occasions, l'échantillonneur utilisé n'a pas recueilli un volume suffisant de précipitation pendant la période d'échantillonnage pour permettre la réalisation d'une analyse chimique convenable. Il a donc été nécessaire de conserver et de réunir des échantillons obtenus pendant des périodes allant jusqu'à quatre mois, ce qui réduit de beaucoup la quantité et l'utilité des données à interpréter.

L'extraction humide des matières organiques présentes dans l'air à l'état de traces s'effectue par entraînement des particules et séparation en phase gazeuse dans l'atmosphère. L'importance relative de ces processus est fonction de la fraction de matières organiques présentes sous forme d'aérosol, de la granulométrie des particules et de la constante de Henry (H) pour la séparation en phase gazeuse. Les propriétés physiques des composés étudiés varient de façon considérable des points de vue de la solubilité aqueuse, de la pression de vapeur et de l'affinité d'association avec la matière particulée.

Certains des composés les moins solubles extraits de l'atmosphère par les précipitations y retournent très probablement à partir de l'échantillon obtenu, ce phénomène se produisant dans l'auget de collecte au cours de la période de prélèvement (Mackay et Leinonen, 1975).

Les précipitations, surtout sous forme de pluie, extraient de façon très efficace la matière particulée de l'atmosphère de sorte que les échantillons présentent généralement une fraction relativement importante de particules. Les techniques d'extraction actuellement utilisées pour l'analyse chimique organique ne permettent pas d'extraire efficacement les composés de la matière particulée (Coburn, 1981).

L'échantillonneur et la méthode d'échantillonnage utilisés dans le cadre du CANSOC ont été conçus afin d'être conformes aux autres appareils et méthodes utilisés pour les autres réseaux au Canada. Mais les autres, le réseau canadien

compared with the organic parameters under investigation by the CANSOC network, these parameters are relatively stable and their behaviour was well documented. In contrast, the organic compounds are relatively insoluble in water, highly volatile and at that time their behaviour was not well understood.

The precipitation samples were composited over a 30-day sampling period. Therefore a sample collected from a precipitation event at the commencement of a sampling period could remain in the collector for up to 30 days. The samplers were operated year-round in all regions of Canada. Therefore over a one-year period, depending on location and season of the year, samples experienced a full range of Canadian climatic conditions. The lids on the samplers did not provide a good seal and were designed to prevent dustfall, bird droppings, leaves and other contamination from entering the collector. They were not designed to prevent evaporation or volatilization of the sample.

In general, the organics in water samples stored in tightly sealed glass containers at 4°C are stable; this cannot be said for the organics of a precipitation sample in a loosely sealed collector bucket at temperatures of up to 30°C or possibly higher.

These factors could explain why the compounds detected most frequently at the highest levels are more water soluble than the compounds detected less frequently. Thus it is very possible that the levels of the less water soluble compounds investigated have been underestimated.

Table 2 also lists the most recent USEPA criteria for the protection of freshwater aquatic life. A comparison of the criteria and the CANSOC data shows that for some compounds (e.g. PCBs) the levels detected in the precipitation frequently exceed the 24-h average criteria. This indicates that the wet deposition of some organic contaminants is significant and poses a threat to the health of aquatic ecosystems.

CONCLUSIONS

The CANSOC network was established to examine precipitation across Canada for the existence and levels of

d'échantilllonnage des précipitations et le réseau des précipitations des Grands lacs, ont été conçus pour l'étude de paramètres de chimie inorganique comme le pH et les teneurs en principaux ions. Ces paramètres comparés à ceux étudiés avec le réseau CANSOC, sont relativement stables et l'on connaît bien leur comportement tandis que les composés organiques sont relativement insolubles dans l'eau, fortement volatils et nous ne connaissons pas encore très bien leur comportement.

Les échantillons de précipitation étaient réunis par périodes de prélèvement de trente jours. Un échantillon obtenu lors d'une précipitation donnée survenant au début de la période pouvait donc demeurer dans le collecteur pendant 30 jours. Les échantillonneurs ont été utilisés tout au long de l'année dans toutes les régions du Canada. Les échantillons subissaient donc, dépendamment de leur position et de la saison, toute la gamme des conditions climatiques canadiennes. Les couvercles des collecteurs ne fermaient pas de façon hermétique. Ils avaient été prévus pour éviter la contamination par la matière particulée, les excréments d'oiseaux, les feuilles, etc. et non pas pour éviter l'évaporation ou la volatilisation de l'échantillon.

D'une façon générale, les matières organiques présentes dans des échantillons d'eau conservés à 4°C dans des contenants de verre scellés sont stables, mais il n'en va pas de même pour les matières organiques présentes dans des échantillons de précipitation dans un auget de collecteur mal fermé et qui sont soumis à des températures pouvant dépasser les 30°C.

Ces facteurs peuvent expliquer pourquoi les composés décelés le plus fréquemment en concentrations les plus importantes sont parmi ceux les plus solubles dans l'eau. Il est donc fort possible que les teneurs des composés moins solubles dans l'eau aient été sous-estimées.

On trouvera aussi au tableau 2 la liste des critères les plus récents de l'EPA américaine relatifs à la protection de la vie aquatique en eau douce. La comparaison de ces valeurs et des données du CANSOC nous permet de voir que pour certains composés, comme les PCB, les teneurs décelées dans les précipitations excèdent souvent la teneur moyenne en 24 h précisée dans ces critères. Le dépôt sous forme humide de certains contaminants organiques est donc appréciable et présente une menace pour les écosystèmes aquatiques.

CONCLUSIONS

Le réseau CANSOC a été créé pour étudier la présence et les teneurs de divers composés organochlorés et des

several organochlorines and PCBs in precipitation. The sampling techniques and sample collectors were based on the state of the art at that time. However, CANSOC and other studies have shown these samplers not to be completely adequate for measuring organic compounds in precipitation. Nevertheless, CANSOC has shown that wet deposition of airborne trace organics occurs in all regions of Canada. For some compounds the results show that this deposition is significant and thus poses a potential threat to the health of aquatic ecosystems. CANSOC has also shown that the long-distance transport of airborne organic contaminants occurs. Locations, such as Gander and Chibougamau, in areas remote from known anthropogenic sources, exhibited concentrations of organics in precipitation similar to those at stations in more populated areas.

PCB dans les précipitations à travers le Canada. Les techniques d'échantillonnage et les collecteurs utilisés ont été conçus en fonction des connaissances alors disponibles. L'étude faite dans le cadre du CANSOC et d'autres études ont cependant montré que les échantillonneurs de ce genre ne convenaient pas parfaitement à la mesure des composés organiques des précipitations. L'étude CANSOC n'en a pas moins montré l'existence du dépôt humide de matières organiques présentes à l'état de traces dans l'atmosphère dans toutes les régions du Canada. Les résultats obtenus indiquent que, pour certains composés, le dépôt est appréciable et présente donc une menace pour les écosystèmes aquatiques. L'étude a aussi permis de montrer qu'il y avait transport à grande distance des contaminants présents à l'état de traces dans l'atmosphère. On a noté, à des endroits tels Gander et Chibougamau qui sont éloignés des sources de pollution humaines, des concentrations de composés organiques dans les précipitations qui étaient du même ordre que celles notées dans des zones plus peuplées.

RECOMMENDATIONS

Based on these conclusions the following recommendations can be made:

1. The importance of the atmosphere for the long-range transport of organic contaminants in the environment is well documented. This transport and resulting wet and dry deposition should be quantified and monitored on a regular basis in all regions of Canada. Surface waters in the same basins as the precipitation sampling stations should also be monitored for the same parameters. This would help in assessing the significance of atmospheric inputs to the quality of surface waters.

2. The development of a suitable sampler for wet deposition of organic contaminants is of paramount importance. Although appropriate sampling methodologies exist, they have not been incorporated into the design of a sampler suitable for year-round use in remote locations and for the severity of the Canadian climate. Some of the factors that must be considered in the design of the new sampler are:

   2.1 Sampler collection efficiency should be maximized for wet and frozen precipitation. This may not be possible because in general the aerodynamics of snowfall collection are different from those for rain collection. To optimize collection efficiency for wet and frozen precipitation, it may be necessary to design and construct two different samplers.

RECOMMANDATIONS

On peut, en se basant sur les conclusions précédentes, faire les recommandations suivantes:

1. L'importance du transport atmosphérique à grande distance des contaminants organiques a fait l'objet de nombreuses publications. Ce transport et les dépôts secs et humides qui en résultent devraient être quantifiés et contrôlés de façon régulière dans toutes les régions canadiennes. Les eaux de surface des bassins hydrographiques où sont situées les stations d'échantillonnage des précipitations devraient aussi faire l'objet d'un contrôle de ces mêmes paramètres. Cela faciliterait l'évaluation de l'influence des apports atmosphériques sur la qualité des eaux de surface.

2. La mise au point d'un échantillonneur approprié aux dépôts humides des contaminants organiques est de la plus haute importance. Il existe des méthodes d'échantillonnage appropriées, mais on ne dispose pas d'un échantillonneur conçu pour une utilisation à longueur d'année dans des régions éloignées et sous la rigueur du climat canadien. Certains des points à considérer dans la conception de ce nouvel échantillonneur sont:

   2.1 L'efficacité de l'échantillonneur devrait être maximisée pour les précipitations humides et gelées. Ceci pourra s'avérer impossible car, d'une façon générale, les principes aérodynamiques du prélèvement de la neige ne sont pas les mêmes que ceux du prélèvement

2.2 Surfaces in contact with the sample must be constructed of materials inert with respect to organic compounds (i.e. glass, stainless steel or Teflon).

2.3 The organic compounds deposited with the precipitation must be prevented from being re-emitted from the sample to the atmosphere.

3. For the interim period, until a network utilizing an improved sampler can be implemented (probably 1984-85), there are four alternatives.

3.1 Deemed inadequate, the present network could be closed down and the samplers recalled.

3.2 The present network could be continued without changes, accepting the fact that the resulting data would be at the most minimum values.

3.3 The present samplers could be relocated while maintaining the same sampling procedures.

3.4 The present samplers could be relocated and the sampling procedures upgraded to reflect recent knowledge. For example, samples could be collected on an event basis and extracted at the site.

Further discussion would be necessary before one of these alternatives could be selected.

4. Present methodologies for the extraction of organic compounds from water samples (e.g. XAD-2 resin columns) do not efficiently extract compounds adsorbed on the particulate matter associated with precipitation samples. Since the particulate matter is a very important fraction of a precipitation sample for the analysis of organic compounds, an efficient method applicable in routine operational conditions is needed for the extraction of a wide spectrum of organic compounds and subsequent analysis.

de la pluie. Il pourrait être nécessaire, pour optimiser l'efficacité du prélèvement de ces deux types de précipitations, de concevoir et de fabriquer deux types différents d'échantillonneurs.

2.2 Les surfaces en contact avec l'échantillon doivent être inertes à l'égard des composés organiques, soit le verre, l'acier inoxydable ou le téflon.

2.3 Il faut empêcher les composés organiques déposés avec les précipitations de retourner dans l'atmosphère.

3. Quatre possibilités s'offrent en attendant qu'un réseau d'échantillonneurs «améliorés» ne soit mis en place, probablement en 1984 ou 1985; ce sont:

3.1 Jugé inapproprié, le réseau actuel peut être abandonné et les échantillonneurs retirés.

3.2 Le réseau actuel peut être exploité sans modification; les données obtenues représentent alors, au mieux, des valeurs minimales.

3.3 Les échantillonneurs actuels peuvent être déplacés, le mode de prélèvement demeurant inchangé.

3.4 Les échantillonneurs actuels peuvent être déplacés, le mode de prélèvement amélioré en fonction des connaissances acquises. Ainsi, les échantillons pourraient être obtenus par événements discrets et l'extraction pourrait se faire sur place.

Il faudrait étudier la question de façon plus approfondie avant de choisir l'une de ces possibilités.

4. Les techniques actuelles d'extraction des composés organiques des échantillons d'eau, comme les colonnes de résine XAD-2, ne permettent pas d'extraire de façon efficace les composés adsorbés sur les particules que l'on trouve dans les précipitations. La matière particulée représentant une fraction importante d'un échantillon de précipitation devant servir à l'analyse des composés organiques, il nous faut une méthode efficace pouvant être utilisée couramment en conditions d'exploitation normales pour l'extraction d'une large gamme de composés organiques et leur analyse ultérieure.

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Tables
Tableaux

Table 1. Sampling Locations

Tableau 1. Lieux d'échantillonnage

Station	Latitude	Longitude
Vancouver (B.C.) / (C.-B.)	49° 10′ 59″	123° 10′ 00″
Edson (Alberta)	53° 34′ 59″	116° 26′ 58″
Fort McMurray (Alberta)	56° 38′ 58″	111° 13′ 00″
Wynyard (Sask.)	51° 46′ 00″	104° 12′ 00″
Atikokan (Ont.)	48° 45′ 00″	91° 37′ 00″
Windsor (Ont.)	42° 16′ 00″	82° 58′ 00″
Mount Forest (Ont.)	43° 58′ 59″	80° 45′ 00″
Maniwaki (Que.) / (Qué.)	46° 22′ 59″	75° 58′ 00″
Chibougamau (Que) / (Qué.)	49° 49′ 00″	74° 25′ 00″
Saint-Hubert (Que.) / (Qué.)	45° 31′ 00″	73° 25′ 00″
Truro (N.S.) / (N.-É.)	45° 22′ 00″	63° 16′ 00″
Gander (Nfld.) / (T.-N.)	48° 56′ 58″	54° 34′ 00″

Table 2. Table of Compounds Investigated and Criteria for the Protection of Freshwater Aquatic Life

Tableau 2. Composés recherchés et critères de protection de la vie aquatique en eau douce

Compound/ Composé	24-h average value/valeur moy. en 24 h (μg/L)	Maximum value/valeur maximale (μg/L)
Heptachlor / Heptachlore	0.0038	0.52
Heptachlor epoxide / Heptachlore époxyde	N.A. / N.D.	N.A. /N.D.
α-Chlordane	0.0043 *	2.4
γ-Chlordane		
p,p′-Methoxychlor / p,p′-Méthoxychlore	N.A. /N.D. (0.03 μg/L)†	N.A. /N.D.
p,p′-DDE		
p,p′-TDE	0.0010	1.1
p,p′-DDT		
o,p′-DDT		
Aldrin / Aldrine	N.A. /N.D.	3.0
Endrin / Endrine	0.0023	0.18
Dieldrin / Dieldrine	0.0019	2.5
Hexachlorobenzene / Hexachlorobenzène	N.A. /N.D.	N.A. /N.D.
Aroclors total / Aroclores totaux	0.014	2.0
α-Endosulfan	0.056	0.22
β-Endosulfan		
γ-BHC / γ-HCB	0.080	2.0
α-BHC /α-HCB	N.A. /N.D.	N.A. /N.D.
Mirex	N.A. /N.D. (0.001 μg/L)†	N.A. /N.D.

* Total concentration of both isomers / Concentration totale des deux isomères

† *Guidelines for Protection of Freshwater Aquatic Life*, USEPA, 1976 / EPA des U.S.A., 1976

N.A. / N.D. – Not available / Non disponible

Source: USEPA. 1980

Table 3. Percentage of Determinations Greater Than or Equal to the Detection Limit

Tableau 3. Pourcentage des valeurs mésurées supérieures ou égales au seuil de détection

Compound/ Composé	Detection limit/ Seuil de détection (μg/L)	Vancouver (20)*	Edson (16)	Fort McMurray (6)	Wynyard (9)	Atikokan (20)	Windsor (21)	Mount Forest (30)	Maniwaki (20)	Chibougamau (16)	Saint-Hubert (11)	Truro (27)	Gander (14)	NAQUADAT parameter code/ code de paramètre
α-BHC/α-HCB	0.001	75	100	100	100	90	95	88	95	88	92	89	93	18077L
γ-BHC (lindane) / γ-HCB	0.001	75	93	100	100	95	90	78	80	100	83	89	93	18072L
α-Endosulfan	0.001	45	25	16	11	25	28	36	20	25	45	70	28	18053L
β-Endosulfan	0.001	75	43	16	11	35	52	56	60	19	55	63	14	18057L
p,p'-Methoxychlor / p,p'-Méthoxychlore	0.001	10	12	0	11	35	86	39	10	6	9	22	7	18033L
Hexachlorobenzene / Hexachlorobenzène	0.001	0	6	33	44	15	14	3	5	0	18	4	14	17810L
Aroclors total (PCBs) / Aroclores totaux (PCB)	0.02	5	6	16	33	15	28	10	0	12	45	7	31	18176L
Mirex	0.001	0	0	0	0	0	0	0	0	0	0	0	0	18126L
p,p'-DDE	0.001	15	6	0	11	10	28	18	10	0	8	15	14	18022L
p,p'-TDE	0.001	0	0	0	0	0	5	3	10	6	9	4	0	18024L
p,p'-DDT	0.001	15	6	66	50	30	86	40	36	31	27	24	16	18004L
o,p'-DDT	0.001	0	0	16	0	5	5	3	5	6	9	7	0	18007L
Heptachlor/Heptachlore	0.001	0	0	0	0	0	0	0	6	0	0	0	0	18042L
Heptachlor epoxide/ Heptachlore époxyde	0.001	5	6	0	33	15	19	3	5	6	0	15	14	18047L
Alpha (cis) chlordane	0.001	0	0	0	0	5	14	7	0	0	27	11	7	18062L
Gamma (trans) chlordane	0.001	5	6	16	44	10	33	6	5	12	0	7	14	18067L
Aldrin / Aldrine	0.001	–	–	–	–	–	–	3	–	–	–	–	–	18132L
Endrin / Endrine	0.001	0	0	0	0	5	5	22	10	12	27	4	7	18142L
Dieldrin / Dieldrine	0.001	10	0	0	55	50	66	55	25	50	45	7	21	18152L

*Number of samples analyzed is given in parentheses

*Le nombre d'échantillons analysés est donné entre parenthèses

Table 4. Distribution of Alpha and Gamma-BHC (μg/L)

Tableau 4. Distribution des isomères alpha et gamma de HCB (μg/L)

Station	No. of samples / Nbre d'échantillons	No. of values less than the detection limit/ Nbre de valeurs inférieures au seuil de détection	α-BHC / α-HCB			No. of values less than the detection limit/ Nbre de valeurs inférieures au seuil de détection	γ-BHC (lindane) /γ-HCB (lindane)		
			mean/moy.	minimum	maximum		mean/moy.	minimum	maximum
Vancouver	20	4	0.0228	<0.001	0.1300	4	0.0052	<0.001	0.0190
Edson	16	0	0.0509	<0.0170	0.0970	1	0.0111	<0.001	0.0220
Fort McMurray	6	0	0.0255	0.0010	0.0500	0	0.0101	0.0030	0.0225
Wynyard	9	0	0.0516	0.0282	0.0870	0	0.0189	0.0077	0.0400
Atikokan	20	2	0.0299	<0.001	0.0680	1	0.0087	<0.001	0.0190
Windsor	21	1	0.0225	<0.001	0.0590	2	0.0075	<0.001	0.0140
Mount Forest	30	4	0.0206	<0.001	0.0690	7	0.0062	<0.001	0.0330
Maniwaki	20	1	0.0264	<0.001	0.0820	4	0.0044	<0.001	0.0107
Chibougamau	16	2	0.0319	<0.001	0.0640	0	0.0066	0.0020	0.0120
Saint-Hubert	11	1	0.0304	<0.001	0.0720	2	0.0059	<0.001	0.0153
Truro	27	2	0.0172	<0.001	0.0430	3	0.0046	<0.001	0.0140
Gander	14	1	0.0286	<0.001	0.0920	1	0.0045	<0.001	0.0110

Appendix
NAQUADAT — Detailed Report

Annexe
NAQUADAT — Rapport détaillé

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33AL07AG0001
REGION/REGION - ALBERTA

LOCATION/LIEU - LAT.053/34/59 LONG. 116/26/58
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : EDSON A , ALTA WMO BACKGROUND AIR POLLUTION STATION. LOCATED AT WEATHER STATION.EDGE OF SMALL TOWN.GAS PLANTS IN VICINITY.LANDUSE MOSTLY GRAIN-LIVESTOCK

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17010L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18120L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1400	162	.0740	.0220	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-01-01	1400	162	.0170	.0070	.0010L	.0010L	.0010L	.0010	.0300	.0010L
78-03-31	2301	162	.0330	.0160	.0010	.0010L	.0010L	.0010L	.0200L	.0010L
78-06-01	1400	162	.0630	.0161	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
78-07-01	1400	162	.0760	.0140	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
78-08-01	1400	162	.0300	.0026	.0010L	.0010	.0020	.0010L	.0200L	.0010L
78-09-01	1400	162	.0420	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-06-04	1400	162	.0830	.0220	.0010	.0050	.0010L	.0010L	.0200L	.0010L
79-06-30	1400	162	.0410	.0110	.0020	.0010L	.0010L	.0010L	.0200L	.0010L
79-07-31	1400	162	.0740	.0170	.0010L	.0020	.0010L	.0010L	.0200L	.0010L
79-10-02	1400	162	.0340	.0040	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
80-01-31	1400	162	.0170	.0060	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-05-31	1300	162	.0970	.0210	.0010	.0010L	.0010L	.0010L	.0200L	.0010L
80-06-30	1200	162	.0524	.0041	.0002	.0043	.0001L	.0001L	.0040	.0001L
80-07-31	1200	162	.0203	.0040	.0001	.0003	.0010	.0001L	.0010L	.0001L
80-08-31	1200	162	.0608	.0116	.0002	.0004	.0001L	.0001	.0090	.0001L

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1400	162	.0010L	.0010L	--	--	.0010L	.0010L	.0010L	.0010L
78-01-01	1400	162	.0020	.0010L	--	--	.0010L	.0010L	.0010L	.0010L
78-03-31	2301	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
78-06-01	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
78-07-01	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
78-08-01	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
78-09-01	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
79-06-04	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
79-06-30	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
79-07-31	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010	.0010L	.0010L
79-10-02	1400	162	.0010L	.0010L	.0020	--	.0010L	.0010L	.0010L	.0010
80-01-31	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
80-05-31	1300	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0002	.0002
80-07-31	1200	162	.0001L	.0001L	.0001	.0004	.0001L	.0001L	.0001	.0001L
80-08-31	1200	162	.0002	.0001	.0001L	.0001L	.0001L	.0001L	.0002	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33AL07AG0001
REGION/REGION - ALBERTA

LOCATION/LIEU - LAT.053/34/59 LONG. 116/26/58
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : EDSON A , ALTA WMO BACKGROUND AIR POLLUTION STATION. LOCATED AT WEATHER STATION.EDGE OF SMALL TOWN.GAS PLANTS IN VICINITY.LANDUSE MOSTLY GRAIN-LIVESTOCK

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-09-01	1400	162	.0010L	.0010L	.0010L
78-01-01	1400	162	.0010L	.0010L	.0010L
78-03-31	2301	162	.0010L	.0010L	.0010L
78-06-01	1400	162	.0010L	.0010L	.0010L
78-07-01	1400	162	.0010L	.0010L	.0010L
78-08-01	1400	162	.0010L	.0010L	.0010L
78-09-01	1400	162	.0010L	.0010L	.0010L
79-06-04	1400	162	.0010L	.0010L	.0010L
79-06-30	1400	162	.0010L	.0010L	.0010L
79-07-31	1400	162	.0010L	.0010L	.0010L
79-10-02	1400	162	.0010L	.0010L	.0010L
80-01-31	1400	162	.0010L	.0010L	.0010L
80-05-31	1300	162	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001L	.0001L	.0001L
80-07-31	1200	162	.0001L	.0001L	.0001L
80-08-31	1200	162	.0001L	.0001L	.0001L

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33AL07CD0001
REGION/REGION - ALBERTA

LOCATION/LIEU - LAT.056/38/58 LONG. 111/13/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : FORT MCMURRAY A,ALTA,CANSAP STATION LOCATED AT AIRPORT 16 KM SE OF TOWN OF10000.MAIN INDUSTRIES ARE OIL SANDS EXTRACTION PLANTS AND LUMBERING. SITE HAS NOTICABLE POLLUTION WITH NNW WIND.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18097L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	201	162	.0280	.0060	.0010L	.0010L	.0010L	.0010	.0200L	.0010L
79-05-31	1400	162	.0080	.0040	.0010L	.0010L	.0010L	.0010L	.0200	.0010L
79-07-01	1400	162	.0900	.0130	.0010L	.0020	.0010L	.0010L	.0200L	.0010L
79-08-01	1400	162	.0010	.0030	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-12-01	1400	162	.0280	.0120	.0010L	.0010L	.0010L	.0010	.0200L	.0010L
80-06-01	1200	162	.0382	.0225	.0031	.0001L	.0001L	.0001L	.0060	.0001L

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	201	162	.0010L	.0010L		--	.0010L	.0010L	.0010L	.0010L
79-05-31	1400	162	.0010L	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L
79-07-01	1400	162	.0010L	.0010L	.0020	--	.0010L	.0010L	.0010L	.0010L
79-08-01	1400	162	.0010L	.0010L	.0010	--	.0010L	.0010L	.0010L	.0010L
79-12-01	1400	162	.0010L	.0010L	.0050	--	.0010L	.0010L	.0010L	.0010L
80-06-01	1200	162	.0001	.0001L	.0005	.0001L	.0001L	.0001L	.0001L	.0032

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-09-01	201	162	.0010L	.0010L	.0010L
79-05-31	1400	162	.0010L	.0010L	.0010L
79-07-01	1400	162	.0010L	.0010L	.0010L
79-08-01	1400	162	.0010L	.0010L	.0010L
79-12-01	1400	162	.0010L	.0010L	.0010L
80-06-01	1200	162	.0001L	.0001L	.0001L

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 338C08MH0001
REGION/REGION - BRITISH COLUMBIA

LOCATION/LIEU - LAT.049/10/59 LONG. 123/10/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : VANCOUVER INTL A,BC,CANSAP STATION LOCATED AT MAJOR AIRPORT IN FRASER RIVER DELTA.THERE ARE A NUMBER OF S AW-
MILLS AND HEAVY INDUSTRIES WITHIN 8KM N. CITY OF 1000000 TO N,E,AND SOUTH

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18097L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1500	162	.0390	.0080	.0010L	.0080	.0010L	.0010L	.0200L	.0010L
78-03-01	1500	162	.0010L	.0040	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-04-01	1500	162	.0160	.0080	.0010	.0020	.0010L	.0010L	.0200L	.0010L
78-08-01	1500	162	.0150	.0010L	.0060	.0010	.0010L	.0010L	.0200	.0010L
78-09-01	1500	162	.0400	.0070	.0020	.0020	.0010L	.0010L	.0200L	.0010L
78-10-01	1500	162	.1300	.0190	.0040	.0050	.0020	.0010L	.0200L	.0010L
78-12-01	1500	161	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-01-01	1500	162	.0050	.0040	.0010	.0010L	.0010L	.0010L	.0200L	.0010L
79-07-01	1400	162	.0260	.0040	.0090	.0220	.0010L	.0010L	.0200L	.0010L
79-09-30	1500	162	.0430	.0080	.0010L	.0020	.0010L	.0010L	.0200L	.0010L
79-10-31	1500	162	.0270	.0060	.0010L	.0020	.0010L	.0010L	.0200L	.0010L
79-11-30	1500	162	.0330	.0040	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
79-12-31	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-01-31	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-02-29	1500	162	.0100	.0030	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
80-03-31	1500	162	.0080	.0050	.0010L	.0040	.0010L	.0010L	.0200L	.0010L
80-05-01	1400	162	.0130	.0090	.0060	.0110	.0020	.0010L	.0200L	.0010L
80-05-31	1400	162	.0220	.0060	.0010	.0030	.0010L	.0010L	.0200L	.0010L
80-06-30	1200	162	.0002	.0007	.0006	.0016	.0001L	.0001L	.0010	.0001L
	1300	162	.0280	.0091	.0046	.0016	.0001L	.0001	.0120	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33BC08MH0001
REGION/REGION - BRITISH COLUMBIA

LOCATION/LIEU - LAT.049/10/59 LONG. 123/10/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : VANCOUVER INTL A,BC,CANSAP STATION LOCATED AT MAJOR AIRPORT IN FRASER RIVER DELTA.THERE ARE A NUMBER OF S AW-
MILLS AND HEAVY INDUSTRIES WITHIN 8KM N. CITY OF 1000000 TO N,E,AND SOUTH

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA- (CIS) CHLORDANE	18067L GAMMA- (TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1500	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-03-01	1500	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-04-01	1500	162	.0010	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-08-01	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-09-01	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1500	162	.0010L	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010L
78-12-01	1500	161	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-01-01	1500	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-07-01	1400	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-09-30	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-10-31	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-11-30	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-12-31	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-01-31	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-02-29	1500	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-03-31	1500	162	.0010	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-05-01	1400	162	.0010	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-05-31	1400	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0030	.0010L	.0010L
80-06-30	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001	.0001
	1300	162	.0001	.0001L	.0001L	.0001L	.0001L	.0001L	.0009	.0013

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33BC08MH0001
REGION/REGION - BRITISH COLUMBIA

LOCATION/LIEU - LAT.049/10/59 LONG. 123/10/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : VANCOUVER INTL A,BC,CANSAP STATION LOCATED AT MAJOR AIRPORT IN FRASER RIVER DELTA.THERE ARE A NUMBER OF S AW-
MILLS AND HEAVY INDUSTRIES WITHIN 8KM N. CITY OF 1000000 TO N,E,AND SOUTH

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-09-01	1500	162	.0010L	.0010L	.0010L
78-03-01	1500	162	.0010L	.0010L	.0010L
78-04-01	1500	162	.0010L	.0010L	.0010L
78-08-01	1500	162	.0010L	.0010L	.0010L
78-09-01	1500	162	.0010L	.0010L	.0010L
78-10-01	1500	162	.0010L	.0010L	.0010L
78-12-01	1500	161	.0010L	.0010L	.0010L
79-01-01	1500	162	.0010L	.0010L	.0010L
79-07-01	1400	162	.0010L	.0010L	.0010L
79-09-30	1500	162	.0010L	.0010L	.0010L
79-10-31	1500	162	.0010L	.0010L	.0010L
79-11-30	1500	162	.0010L	.0010L	.0010
79-12-31	1500	162	.0010L	.0010L	.0010L
80-01-31	1500	162	.0010L	.0010L	.0010L
80-02-29	1500	162	.0010L	.0010L	.0010L
80-03-31	1500	162	.0010L	.0010L	.0010L
80-05-01	1400	162	.0010L	.0010L	.0010L
80-05-31	1400	162	.0010L	.0010L	.0010
80-06-30	1200	162	.0001L	.0001L	.0001L
	1300	162	.0001L	.0001L	.0001L

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33NF02YQ0001
REGION/REGION - NEWFOUNDLAND

LOCATION/LIEU - LAT.048/56/58 LONG. 054/34/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : GANDER INTL A,NFLD, CANSAP STATION. LOCATED AT MAJOR AIRPORT 3KM ESE OF A TOWN OF 8000. NO SIGNIFICANT INDUST IN THE AREA.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1100	162	.0920	.0110	.0010L	.0010L	.0010L	--	--	--
77-10-01	1100	162	.0430	.0060	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-02-28	2301	162	.0210	.0060	.0010	.0010	.0010L	.0040	.0500	.0010L
79-06-30	930	162	.0290	.0020	.0010L	.0010L	.0010	.0010L	.0200	.0010L
79-07-31	930	162	.0170	.0030	.0010	.0010L	.0010L	.0010L	.0200L	.0010L
79-08-31	1030	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0300	.0010L
79-10-31	1030	162	.0200	.0060	.0010L	.0010L	.0010L	.0010	.0500	.0010L
80-01-31	1030	162	.0100	.0030	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-05-31	1200	162	.0165	.0036	.0001L	.0004	.0001L	.0001L	.0020	.0001L
80-06-30	1200	162	.0131	.0024	.0002	.0003	.0001L	.0001L	.0050	.0001L
80-07-31	1200	162	.0294	.0043	.0001	.0004	.0001L	.0001L	.0010L	.0001L
80-09-01	1200	162	.0368	.0045	.0001L	.0001L	.0002	.0001	.0050	.0001L
80-09-30	1200	162	.0622	.0080	.0012	.0025	.0008	.0001	.0030	--
80-11-01	1200	162	.0140	.0026	.0046	.0001L	.0001L	.0001L	.0020	.0001L

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1100	162	.0030	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-10-01	1100	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-02-28	2301	162	.0010L	.0010L	.0100	.0010L	.0010L	.0070	.0010L	.0040
79-06-30	930	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010
79-07-31	930	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-08-31	1030	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-10-31	1030	162	.0010	.0010L	.0010	.0010L	.0010L	.0180	.0010L	.0010L
80-01-31	1030	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-05-31	1200	162	.0001	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001
80-06-30	1200	162	.0001L	.0001L	.0006	.0001L	.0001L	.0001L	.0009	.0003
80-07-31	1200	162	.0001L	.0001L	.0001	.0007	.0001L	.0001L	.0001	.0002
80-09-01	1200	162	.0002	.0006	.0005	.0001L	.0001L	.0007	.0004	.0001L
80-09-30	1200	162	.0001	.0001L	.0008	.0001L	.0001L	.0001L	.0017	.0001L
80-11-01	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0004	.0001L	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33NF02YQ0001
REGION/REGION - NEWFOUNDLAND

LOCATION/LIEU - LAT.048/56/58 LONG. 054/34/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : GANDER INTL A,NFLD, CANSAP STATION. LOCATED AT MAJOR AIRPORT 3KM ESE OF A TOWN OF 8000. NO SIGNIFICANT INDUST IN THE AREA.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-09-01	1100	162	.0010L	.0010L	.0010L
77-10-01	1100	162	.0010L	.0010L	.0010L
78-02-28	2301	162	.0010L	.0010	.0020
79-06-30	930	162	.0010L	.0010L	.0010L
79-07-31	930	162	.0010L	.0010L	.0010L
79-08-31	1030	162	.0010L	.0010L	.0010L
79-10-31	1030	162	.0010L	.0010L	.0010
80-01-31	1030	162	.0010L	.0010L	.0010L
80-05-31	1200	162	.0001L	.0001L	.0001L
80-06-30	1200	162	.0001L	.0001L	.0001L
80-07-31	1200	162	.0001L	.0001	.0001
80-09-01	1200	162	.0001L	.0007	.0001L
80-09-30	1200	162	.0001L	.0001L	.0012
80-11-01	1200	162	.0001L	.0001L	.0001L

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33HS01DH0001
REGION/REGION - NOVA SCOTIA

LOCATION/LIEU - LAT.045/22/00 LONG. 063/16/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : TRURO,N.S.,CANSAP STATION. LOCATED BESIDE SMALL TOWN. LAND USE ISMAINLY DAIRYING AND LUMBERING. THER IS EXTENSIVE LIGHT INDUSTRY IN THE TOWN.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17010L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1100	162	.0050	.0060	.0080	.0010L	.0010L	.0010L	.0200L	.0010L
77-09-01	1100	162	.0050	.0110	.0040	.0030	.0010L	.0010L	.0200L	.0010L
77-10-01	1100	162	.0330	.0050	.0030	.0010L	.0010L	.0010L	.0200L	.0010L
77-11-01	1100	162	.0320	.0050	.0050	.0030	.0010L	.0010L	.0200L	.0010L
77-12-01	1100	162	.0240	.0050	.0020	.0030	.0010L	.0010L	.0200L	.0010L
78-02-01	1100	162	.0030	.0020	.0030	.0010L	.0010L	.0020	.0200	.0010L
78-03-31	2301	162	.0200	.0040	.0020	.0020	.0010L	.0010L	.0200L	.0010L
78-07-01	1100	162	.0400	.0090	.0040	.0060	.0010L	.0010L	.0200L	.0010L
78-08-01	1030	162	.0220	.0060	.0020	.0040	.0030	.0010L	.0200L	.0010L
78-10-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-12-01	1030	161	.0040	.0010	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-06-30	1000	162	.0190	.0030	.0020	.0020	.0010L	.0010L	.0200L	.0010L
	1001	162	.0080	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-07-31	1000	162	.0120	.0020	.0030	.0010L	.0010L	.0010L	.0200L	.0010L
79-08-31	1000	162	.0210	.0030	.0040	.0050	.0020	.0010L	.0200L	.0010L
79-09-30	1100	162	.0380	.0140	.0050	.0010	.0020	.0010L	.0200L	.0010L
79-10-31	1100	162	.0430	.0130	.0010L	.0010	.0010L	.0010L	.0400	.0010L
	1101	162	.0210	.0070	.0030	.0010L	.0010L	.0010L	.0200L	.0010L
	1102	162	.0220	.0060	.0020	.0010L	.0010	.0010L	.0200L	.0010L
80-01-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-02-01	1030	162	.0060	.0020	.0010	.0010	.0010	.0010L	.0200L	.0010L
80-04-01	1030	162	.0100	.0030	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
80-05-01	930	162	.0090	.0030	.0010	.0010	.0010L	.0010L	.0200L	.0010L
80-06-01	930	162	.0150	.0060	.0010	.0010	.0010L	.0010L	.0200L	.0010L
80-07-01	1200	162	.0002	.0012	.0005	.0010	.0001L	.0010	.0140	.0001L
80-07-31	1200	162	.0271	.0045	.0011	.0025	.0014	.0001	.0010L	.0001L
80-09-01	1200	162	.0249	.0031	.0009	.0016	.0001L	.0001L	.0100	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33HS01DH0001
REGION/REGION - NOVA SCOTIA

LOCATION/LIEU - LAT.045/22/00 LONG. 063/16/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : TRURO,N.S.,CAMSAP STATION. LOCATED BESIDE SMALL TOWN. LAND USE ISMAINLY DAIRYING AND LUMBERING. THER IS EXTENSIVE LIGHT INDUSTRY IN THE TOWN.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA- (CIS) CHLORDANE	18067L GAMMA- (TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1100	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-09-01	1100	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-10-01	1100	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-11-01	1100	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-12-01	1100	162	.0010	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-02-01	1100	162	.0010	.0010L	--	.0010L	.0010L	.0010L	.0010	.0020
78-03-31	2301	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-07-01	1100	162	.0010L	.0010L	.0030	.0010L	.0010L	.0010L	.0010L	.0010L
78-08-01	1030	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-12-01	1030	161	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-06-30	1000	162	.0010L	.0010	.0030	.0010	.0010L	.0010L	.0030	.0010
	1001	162	.0010L	.0010L	.0040	.0010	.0010L	.0010L	.0010	.0010L
79-07-31	1000	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-08-31	1000	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-09-30	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0110	.0010L	.0010L
79-10-31	1100	162	.0010L	.0010L	.0010	.0010L	.0010L	.0120	.0010L	.0010L
	1101	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0070	.0010L	.0010L
	1102	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0060	.0010L	.0010L
80-01-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-02-01	1030	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-04-01	1030	162	.0010	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-05-01	930	162	.0010	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-06-01	930	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-07-01	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L
80-07-31	1200	162	.0001L	.0007	.0006	.0001L	.0001L	.0001L	.0006	.0007
80-09-01	1200	162	.0002	.0001L	.0001L	.0001L	.0001L	.0001L	.0002	.0002

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33NS01DH0001
REGION/REGION - NOVA SCOTIA

LOCATION/LIEU - LAT.045/22/00 LONG. 063/16/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : TRURO,N.S.,CANSAP STATION. LOCATED BESIDE SMALL TOWN. LAND USE ISMAINLY DAIRYING AND LUMBERING. THER IS EXTENSIVE LIGHT INDUSTRY IN THE TOWN.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	10132L ALDRIN	10142L ENDRIN	10192L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-08-01	1100	162	.0010L	.0010L	.0010L
77-09-01	1100	162	.0010L	.0010L	.0010L
77-10-01	1100	162	.0010L	.0010L	.0010L
77-11-01	1100	162	.0010L	.0010L	.0010L
77-12-01	1100	162	.0010L	.0010L	.0010L
78-02-01	1100	162	.0010L	.0010L	.0030
78-03-31	2301	162	.0010L	.0010L	.0010L
78-07-01	1100	162	.0010L	.0010	.0010L
78-08-01	1030	162	.0010L	.0010L	.0010
78-10-01	1100	162	.0010L	.0010L	.0010L
78-12-01	1030	161	.0010L	.0010L	.0010L
79-06-30	1000	162	.0010L	.0010L	.0010L
	1001	162	.0010L	.0010L	.0010L
79-07-31	1000	162	.0010L	.0010L	.0010L
79-08-31	1000	162	.0010L	.0010L	.0010L
79-09-30	1100	162	.0010L	.0010L	.0010L
79-10-31	1100	162	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0010L
	1102	162	.0010L	.0010L	.0010L
80-01-01	1100	162	.0010L	.0010L	.0010L
80-02-01	1030	162	.0010L	.0010L	.0010L
80-04-01	1030	162	.0010L	.0010L	.0010L
80-05-01	930	162	.0010L	.0010L	.0010L
80-06-01	930	162	.0010L	.0010L	.0010L
80-07-01	1200	162	.0001L	.0001L	.0001L
80-07-31	1200	162	.0001L	.0005	.0002
80-09-01	1200	162	.0001L	.0001	.0001

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 330N02FC0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.043/58/59 LONG. 080/45/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : MOUNT FOREST, ONTARIO WMO BACKGROUND AIR POLLUTION STATION LOCATED AT WEATHER STATION.SOILS AR GREY BROWN PODZOLIC TYPES.DAIRY FARM ECONOMY.LIME KILN 70KM SW

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-04-01	1200	162	.0160	.0100	.0010	.0010	.0010L	.0010L	.0200L	.0010L
77-08-01	1200	162	.0250	.0030	.0010L	.0050	.0010L	.0010L	.0200L	.0010L
77-09-01	1200	162	.0270	.0100	.0010L	.0040	.0020	.0010L	.0200L	.0010L
77-10-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010	.0200L	.0010L
77-11-01	1200	162	.0270	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
77-12-01	1200	162	.0010	.0030	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-06-01	1200	162	.0110	.0040	.0040	.0010L	.0050	.0010L	.0200	.0010L
78-08-01	1200	162	.0100	.0040	.0020	.0100	.0030	.0010L	.0300	.0010L
	1201	162	.0150	.0050	.0010L	.0080	.0070	.0010L	.0200L	.0010L
78-09-01	1200	162	.0290	.0080	.0010	.0030	.0050	.0010L	.0200L	.0010L
	1201	162	.0330	.0090	.0010	.0030	.0030	.0010L	.0200L	.0010L
78-11-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
	1201	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-05-31	1100	162	.0380	.0150	.0110	.0160	.0110	.0010L	.0200L	.0010L
	1101	162	.0310	.0100	.0010L	.0090	.0010L	.0010L	.0200L	.0010L
79-07-01	1100	162	.0420	.0110	.0010L	.0060	.0010	.0010L	.0200	.0010L
	1101	162	.0440	.0090	.0010	.0110	.0070	.0010L	.0200L	.0010L
79-08-06	1100	162	.0260	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
	1101	162	.0230	.0020	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-09-01	1100	162	.0310	.0060	.0010L	.0020	.0010	.0010L	.0200L	.0010L
	1101	162	.0570	.0100	.0010	.0020	.0010L	.0010L	.0200L	.0010L
79-10-01	1200	162	.0690	.0330	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-11-01	1200	162	.0020	.0100	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-12-02	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-12-31	1200	162	.0050	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-02-01	1200	162	.0100	.0040	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-04-02	1200	162	.0160	.0070	.0010L	.0010	.0010	.0010L	.0200L	.0010L
80-05-01	1200	162	.0200	.0110	.0010	.0040	.0030	.0010L	.0200L	.0010L
80-07-01	1200	162	.0054	.0017	.0002	.0009	.0001L	.0001L	.0010	.0001L
80-08-01	1200	162	.0216	.0062	.0011	.0023	.0006	.0001L	.0010L	.0001L
80-09-01	1200	162	.0082	.0048	.0015	.0003	.0006	.0001	.0010L	.0001L
80-10-01	1200	162	.0060	.0013	.0002	.0003	.0004	.0001L	.0010	.0001L
80-11-01	1200	162	.0320	.0082	.0007	.0041	.0014	.0002	.0140	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33ON02FC0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.043/58/59 LONG. 080/49/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : MOUNT FOREST, ONTARIO WMO BACKGROUND AIR POLLUTION STATION LOCATED AT WEATHER STATION.SOILS AR GREY BROWN PODZOLIC TYPES.DAIRY FARM ECONOMY.LIME KILN 70KM SW

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA- (CIS) CHLORDANE	18067L GAMMA- (TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-04-01	1200	162	.0010	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-08-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-09-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-10-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-11-01	1200	162	.0010	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-12-01	1200	162	.0010L	.0020	--	.0010	.0010L	.0010L	.0010	.0010
78-06-01	1200	162	.0010	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010L
78-08-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0030	.0010L	.0010L
	1201	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
	1201	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-11-01	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
	1201	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-05-31	1100	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0020	.0010L	.0010L	.0010L	.0010	.0010
79-07-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-08-06	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-09-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-10-01	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-11-01	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0030	.0010L	.0020
79-12-02	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-12-31	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-02-01	1200	162	.0030	.0010L	.0030	.0010L	.0010L	.0010L	.0010L	.0010L
80-04-02	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
80-05-01	1200	162	.0010	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010L
80-07-01	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001	.0001
80-08-01	1200	162	.0001L	.0001L	.0007	.0009	.0001L	.0001L	.0002	.0001
80-09-01	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001	.0003
80-10-01	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001	.0001L
80-11-01	1200	162	.0012	.0001L	.0026	.0001L	.0002	.0001	.0019	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 330N02FC0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.043/58/59 LONG. 080/45/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : MOUNT FOREST, ONTARIO WMO BACKGROUND AIR POLLUTION STATION LOCATED AT WEATHER STATION.SOILS AR GREY BROWN PODZOLIC TYPES.DAIRY FARM ECONOMY.LIME KILN 70KM SW

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-04-01	1200	162	.0010L	.0010	.0010
77-08-01	1200	162	.0010L	.0010	.0010L
77-09-01	1200	162	.0010L	.0010L	.0010L
77-10-01	1200	162	.0010L	.0010L	.0010
77-11-01	1200	162	.0010L	.0010L	.0030
77-12-01	1200	162	.0010L	.0010L	.0010L
78-06-01	1200	162	.0010L	.0010L	.0010L
78-08-01	1200	162	.0010L	.0010	.0010
	1201	162	.0010L	.0010	.0010
78-09-01	1200	162	.0010L	.0010	.0020
	1201	162	.0010L	.0010L	.0020
78-11-01	1200	162	.0010L	.0010L	.0010L
	1201	162	.0010L	.0010L	.0010L
79-05-31	1100	162	.0010L	.0010L	.0010
	1101	162	.0010L	.0010L	.0010
79-07-01	1100	162	.0010L	.0010L	.0010
	1101	162	.0010L	.0010L	.0010
79-08-06	1100	162	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0030
79-09-01	1100	162	.0010L	.0010L	.0010
	1101	162	.0010L	.0010L	.0010
79-10-01	1200	162	.0010	.0010L	.0010L
79-11-01	1200	162	.0010L	.0010	.0010
79-12-02	1200	162	.0010L	.0010L	.0010L
79-12-31	1200	162	.0010L	.0010L	.0010L
80-02-01	1200	162	.0010L	.0010L	.0010
80-04-02	1200	162	.0010L	.0010L	.0010L
80-05-01	1200	162	.0010L	.0010L	.0010
80-07-01	1200	162	.0001L	.0001L	.0001L
80-08-01	1200	162	.0001L	.0002	.0007
80-09-01	1200	162	.0001L	.0001L	.0003
80-10-01	1200	162	.0001L	.0001	.0003
80-11-01	1200	162	.0001L	.0035	.0063

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33ON02GH0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.042/16/00 LONG. 082/58/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : WINDSOR A,ONT, CANSAP STATION LOCATED ON SE SIDE OF CITY AT AIRPORT.HEAVY INDUSTRIES TO N AND NW.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1200	162	.0320	.0100	.0010	.0050	.0200	.0010L	.0200L	.0010L
77-10-01	1200	162	.0410	.0090	.0010L	.0010L	.0140	.0010L	.0200	.0010L
77-12-01	1200	162	.0230	.0080	.0010L	.0010L	.0230	.0010L	.0200L	.0010L
78-01-01	1200	162	.0140	.0020	.0010	.0010L	.0260	.0010L	.0200L	.0010L
78-02-01	1200	162	.0030	.0040	.0010L	.0010L	.0060	.0010L	.0200L	.0010L
78-04-01	1200	162	.0190	.0080	.0010L	.0010L	.0390	.0040	.0200L	.0010L
78-05-01	1200	162	.0030	.0080	.0010L	.0010	.1250	.0010	.0200L	.0010L
78-06-01	1200	162	.0120	.0060	.0010L	.0050	.0890	.0010L	.0300	.0010L
78-09-01	1200	162	.0210	.0070	.0010L	.0070	.0430	.0010L	.0200L	.0010L
78-10-01	1200	162	.0590	.0120	.0010L	.0040	.0410	.0010L	.0200	.0010L
78-12-01	1200	161	.0010L	.0010L	.0010L	.0010L	.0060	.0010L	.0200L	.0010L
79-01-01	1200	162	.0030	.0010L	.0010L	.0010L	.0050	.0010L	.0200L	.0010L
79-05-22	1100	162	.0360	.0130	.1160	.0110	.2550	.0010L	.0200L	.0010L
79-05-31	1100	162	.0450	.0120	.0090	.0170	.0010L	.0010L	.0200	.0010L
79-06-30	1100	162	.0220	.0080	.0100	.0310	.0010L	.0010L	.0300	.0010L
79-08-01	1100	162	.0170	.0030	.0010	.0020	.0010	.0010L	.0200L	.0010L
79-09-30	1200	162	.0440	.0140	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
79-11-30	1200	162	.0170	.0100	.0010L	.0010L	.0180	.0010	.0300	.0010L
79-12-31	1200	162	.0060	.0040	.0010L	.0010L	.0560	.0010L	.0200L	.0010L
80-06-30	1200	162	.0197	.0102	.0004	.0029	.0022	.0001L	.0020	.0001L
80-09-30	1200	162	.0361	.0096	.0002	.0007	.0053	.0002	.0140	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33DN02GH0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.042/16/00 LONG. 082/58/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : WINDSOR A,ONT, CANSAP STATION LOCATED ON SE SIDE OF CITY AT AIRPORT.HEAVY INDUSTRIES TO N AND NW.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-09-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-10-01	1200	162	.0020	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010
77-12-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010	.0010L	.0010L
78-01-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-02-01	1200	162	.0050	.0010L	--	.0030	.0010L	.0010	.0010	.0040
78-04-01	1200	162	.0020	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010
78-05-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-06-01	1200	162	.0010	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010
78-09-01	1200	162	.0010L	.0010L	.0030	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1200	162	.0010	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-12-01	1200	161	.0010L	.0010L	.0030	.0010L	.0010L	.0010L	.0010L	.0010L
79-01-01	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-05-22	1100	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010	.0010L
79-05-31	1100	162	.0010L	.0010L	.0070	.0010L	.0010L	.0010L	.0010L	.0010L
79-06-30	1100	162	.0010L	.0010	.0010	.0010L	.0010L	.0010L	.0010L	.0010
79-08-01	1100	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-09-30	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0150	.0010L	.0010
79-11-30	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0460	.0010L	.0010
79-12-31	1200	162	.0010	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001	.0001L	.0009	.0005	.0001L	.0001L	.0003	.0001
80-09-30	1200	162	.0004	.0001L	.0011	.0001L	.0001L	.0001L	.0014	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 330N02GH0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.042/16/00 LONG. 082/59/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : WINDSOR A,ONT, CANSAP STATION LOCATED ON SE SIDE OF CITY AT AIRPORT.HEAVY INDUSTRIES TO N AND NW.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L MEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-09-01	1200	162	.0010L	.0010L	.0010L
77-10-01	1200	162	.1000L	.0010L	.0030
77-12-01	1200	162	.0010L	.0010L	.0010L
78-01-01	1200	162	.0010L	.0010L	.0010L
78-02-01	1200	162	.0010L	.0010L	.0040
78-04-01	1200	162	.0010L	.0010L	.0020
78-05-01	1200	162	.0010L	.0010L	.0030
78-06-01	1200	162	.0010L	.0010L	.0020
78-09-01	1200	162	.0010L	.0010L	.0020
78-10-01	1200	162	.0010L	.0010L	.0010L
78-12-01	1200	161	.0010L	.0010L	.0010L
79-01-01	1200	162	.0010L	.0010L	.0010L
79-05-22	1100	162	.0010L	.0010L	.0010
79-05-31	1100	162	.0010L	.0010L	.0030
79-06-30	1100	162	.0010L	.0010L	.0020
79-08-01	1100	162	.0010L	.0010L	.0010
79-09-30	1200	162	.0010L	.0010L	.0020
79-11-30	1200	162	.0010L	.0010	.0030
79-12-31	1200	162	.0010L	.0010L	.0020
80-06-30	1200	162	.0001L	.0002	.0009
80-09-30	1200	162	.0001L	.0004	.0024

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 330N05PB0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.048/49/00 LONG. 091/37/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : ATIKOKAN,ONT, CANSAP STATION LOCATED ON EAST SIDE OF SMALL TOWN. IRON MINES N AND NE AT 7 AND 14 KM
HILLY WOODED AREA WITH MANY SMALL LAKES.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18007L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18093L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1200	162	.0560	.0140	.0010L	.0010L	.0100	.0010L	.0200L	.0010L
77-09-01	1200	162	.0300	.0110	.0010L	.0010L	.0180	.0010L	.0200L	.0010L
77-10-01	1200	162	.0380	.0060	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
77-12-01	1	162	.0270	.0100	.0010L	.0010	.0010L	.0080	.0200L	.0010L
78-06-01	1	162	.0310	.0110	.0010L	.0010L	.0040	.0010L	.0200L	.0010L
78-07-01	1200	162	.0680	.0140	.0020	.0010L	.0020	.0010L	.0200L	.0010L
78-08-01	1200	162	.0330	.0060	.0010L	.0040	.0010L	.0010L	.0400	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-11-01	1200	161	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-01-01	1100	162	.0430	.0120	.0010L	.0010	.0010	.0010L	.0200L	.0010L
79-06-30	1100	162	.0240	.0190	.0010L	.0040	.0010L	.0010L	.0200L	.0010L
79-07-31	1100	162	.0380	.0080	.0010	.0020	.0010L	.0010L	.0200L	.0010L
79-08-31	1200	162	.0360	.0100	.0010L	.0010L	.0010L	.0010L	.0400	.0010L
79-10-31	1200	162	.0140	.0080	.0010L	.0010L	.0010L	.0020	.0300	.0010L
80-01-31	1200	162	.0110	.0050	.0020	.0010	.0010	.0010	.0200L	.0010L
80-05-31	1200	162	.0200	.0040	.0020	.0010L	.0010L	.0010L	.0200L	.0010L
80-06-30	1200	162	.0131	.0014	.0003	.0010	.0001L	.0001L	.0090	.0001L
80-07-31	1200	162	.0561	.0160	.0001	.0001	.0001L	.0001L	.0020	.0001L
80-08-31	1200	162	.0296	.0114	.0004	.0002	.0001L	.0001L	.0010	.0001L
80-09-30	1200	162	.0297	.0058	.0022	.0005	.0015	.0001	.0040	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33ONO5PB0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.048/45/00 LONG. 091/37/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : ATIKOKAN,ONT, CANSAP STATION LOCATED ON EAST SIDE OF SMALL TOWN. IRON MINES N AND NE AT 7 AND 14 KM
HILLY WOODED AREA WITH MANY SMALL LAKES.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-09-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-10-01	1200	162	.0020	.0010L	--	.0010	.0010L	.0010L	.0010L	.0010L
77-12-01	1	162	.0010	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010L
78-06-01	1	162	.0010L	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010L
78-07-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010	.0010L
78-08-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0090	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-11-01	1200	161	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010
79-01-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-06-30	1100	162	.0010L	.0010L	.0020	.0010L	.0010L	.0010L	.0010L	.0010L
79-07-31	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-08-31	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0060	.0010L	.0010L
79-10-31	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0020	.0010L	.0010L
80-01-31	1200	162	.0010L	.0010L	.0050	.0010L	.0010L	.0010L	.0010L	.0010
80-05-31	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001	.0001L	.0001L	.0001L	.0001L	.0001L	.0002	.0003
80-07-31	1200	162	.0001	.0001L	.0009	.0004	.0001L	.0002	.0002	.0001L
80-08-31	1200	162	.0001	.0001L	.0001L	.0001L	.0001L	.0001L	.0001	.0001
80-09-30	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33ON05PB0001
REGION/REGION - ONTARIO

LOCATION/LIEU - LAT.048/45/00 LONG. 091/37/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : ATIKOKAN,ONT, CANSAP STATION LOCATED ON EAST SIDE OF SMALL TOWN. IRON MINES N AND NE AT 7 AND 14 KM
HILLY WOODED AREA WITH MANY SMALL LAKES.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-08-01	1200	162	.0010L	.0010L	.0010L
77-09-01	1200	162	.0010L	.0010L	.0010L
77-10-01	1200	162	.0010L	.0010L	.0010
77-12-01	1	162	.0010L	.0010L	.0010
78-06-01	1	162	.0010L	.0010L	.0010
78-07-01	1200	162	.0010L	.0010L	.0010
78-08-01	1200	162	.0010L	.0010	.0010
78-09-01	1200	162	.0010L	.0010L	.0010L
78-11-01	1200	161	.0010L	.0010L	.0010
79-01-01	1100	162	.0010L	.0010L	.0010
79-06-30	1100	162	.0010L	.0010L	.0010L
79-07-31	1100	162	.0010L	.0010L	.0010
79-08-31	1200	162	.0010L	.0010L	.0010L
79-10-31	1200	162	.0010L	.0010L	.0010
80-01-31	1200	162	.0010L	.0010L	.0010
80-05-31	1200	162	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001L	.0001L	.0001L
80-07-31	1200	162	.0001L	.0002	.0001
80-08-31	1200	162	.0001L	.0001L	.0004
80-09-30	1200	162	.0001L	.0003	.0001L

FOOTNOTE: L - LESS THAN DETECTION LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION

G - GREATER THAN MEASUREMENT LIMIT
G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 330U02LH0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.046/22/59 LONG. 075/58/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : MANIWAKI, QUEBEC WMO BACKGROUND AIR POLLUTION STATION LOCATED AT WEATHER STATION ON EDGE

SMALL TOWN.LOGGING-MILLING IN VICINITYPODZOLIC SOILS MIXED WITH ROCK-PEAT

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18097L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17010L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1200	162	.0290	.0040	.0010L	.0030	.0010L	.0010L	.0200L	.0010L
77-09-01	1200	162	.0490	.0070	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
77-11-01	1200	162	.0260	.0010L	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
77-12-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-01-01	1200	162	.0030	.0040	.0010	.0010L	.0010L	.0010L	.0200L	.0010L
78-04-01	1200	162	.0180	.0080	.0010	.0030	.0010L	.0010L	.0200L	.0010L
78-06-01	1200	162	.0220	.0010L	.0010L	.0060	.0010L	.0010L	.0200L	.0010L
78-09-01	1200	162	.0480	.0080	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
78-10-01	1200	162	.0820	.0010L	.0010L	.0030	.0020	.0010	.0200L	.0010L
79-01-01	1200	162	.0080	.0010	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-03-01	1100	162	.0340	.0060	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
79-10-01	1100	162	.0390	.0080	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-10-31	1100	162	.0320	.0050	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
79-12-01	1100	162	.0120	.0020	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-02-01	1100	162	.0070	.0030	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
80-04-01	1100	162	.0330	.0060	.0010	.0020	.0010L	.0010L	.0200L	.0010L
80-05-01	1000	162	.0130	.0060	.0010L	.0020	.0010L	.0010L	.0200L	.0010L
80-07-31	1200	162	.0100	.0029	.0007	.0011	.0018	.0001L	.0010	.0001L
80-09-01	1200	162	.0283	.0107	.0011	.0003	.0001L	.0001L	.0030	.0001L
80-10-01	1200	162	.0339	.0072	.0006	.0005	.0002	.0001L	.0030	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33QU02LH0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.046/22/59 LONG. 075/58/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : MANIWAKI, QUEBEC WMO BACKGROUND AIR POLLUTION STATION LOCATED AT WEATHER STATION ON EDGE SMALL TOWN.LOGGING-MILLING IN VICINITY.PODZOLIC SOILS MIXED WITH ROCK-PEAT

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA- (CIS) CHLORDANE	18067L GAMMA- (TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-09-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-11-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
77-12-01	1200	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-01-01	1200	162	.0010	.0010L	--	.0010L	.0010L	.0050	.0010L	.0010L
78-04-01	1200	162	.0040	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-06-01	1200	162	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1200	162	.0010L	.0010L	.0020	.0020	.0010L	.0010L	.0010L	.0020
79-01-01	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-03-01	1100	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-10-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-10-31	1100	162	.0010L	.0010	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-12-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-02-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-04-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-05-01	1000	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-07-31	1200	162	.0001L	.0002	.0003	.0002	.0001L	.0001L	.0002	.0001
80-09-01	1200	162	.0001	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L
80-10-01	1200	162	.0002	.0001L	.0001L	.0001L	.0001L	.0003	.0003	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33QU02LH0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.046/22/59 LONG. 079/58/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : MANIWAKI, QUEBEC

WMO BACKGROUND AIR POLLUTION STATION LOCATED AT WEATHER STATION ON EDGE

SMALL TOWN.LOGGING-MILLING IN VICINITYPODZOLIC SOILS MIXED WITH ROCK-PEAT

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18192L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-08-01	1200	162	.0010L	.0010L	.0010L
77-09-01	1200	162	.0010L	.0010L	.0010
77-11-01	1200	162	.0010L	.0010L	.0010
77-12-01	1200	162	.0010L	.0010L	.0010L
78-01-01	1200	162	.0010L	.0010L	.0010L
78-04-01	1200	162	.0010L	.0010	.0010
78-06-01	1200	162	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0100
78-10-01	1200	162	.0010L	.0010L	.0010L
79-01-01	1200	162	.0010L	.0010L	.0010L
79-03-01	1100	162	.0010L	.0010L	.0010L
79-10-01	1100	162	.0010L	.0010L	.0010L
79-10-31	1100	162	.0010L	.0010	.0010
79-12-01	1100	162	.0010L	.0010L	.0010L
80-02-01	1100	162	.0010L	.0010L	.0010L
80-04-01	1100	162	.0010L	.0010L	.0010L
80-05-01	1000	162	.0010L	.0010L	.0010L
80-07-31	1200	162	.0001L	.0001	.0002
80-09-01	1200	162	.0001L	.0001L	.0001L
80-10-01	1200	162	.0001L	.0003	.0003

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33QU020J0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.045/31/00 LONG. 073/25/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : ST HUBERT A,QUE,CANSAP STATION. LOCATED AT AIRPORT ON THE EAST SIDE OF CITY OF MONTREAL. LAND USE THE IMMEDIATE AREA IS AGRICULTURAL.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
78-02-01	201	162	.0100	.0030	.0010L	.0010L	.0010L	.0010	.0300	.0010L
78-04-01	201	162	.0380	.0110	--	--	--	--	--	--
	1200	162	.0260	.0050	.0010L	.0010L	.0020	.0010L	.0200L	.0010L
78-07-01	1200	162	.0490	.0070	.0040	.0100	.0010L	.0010L	.0200	.0010L
78-08-01	1200	162	.0140	.0020	.0010	.0020	.0010L	.0010L	.0200	.0010L
78-09-01	1200	162	.0350	.0090	.0030	.0030	.0010L	.0010L	.0200	.0010L
78-10-01	1200	162	.0720	.0010L	.0010L	.0020	.0010L	.0010L	.0200	.0010L
78-11-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-07-31	1200	162	.0341	.0077	.0011	.0025	.0001	.0001L	.0010	.0001L
80-08-31	1200	162	.0243	.0153	.0013	.0020	.0001L	.0001L	.0030	.0001L
80-09-30	1200	162	.0212	.0036	.0008	.0008	.0001L	.0001	.0020	.0001L
80-10-31	1200	162	.0407	.0067	.0002	.0009	.0004	.0014	.0020	.0001L

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
78-02-01	201	162	.0010L	.0030	.0070	.0010	.0010L	.0010L	.0010	.0010L
78-04-01	201	162	--	--	--	--	.0010L	--	--	--
	1200	162	.0020	.0010L	--	.0010L	.0010L	.0010L	.0010	.0010L
78-07-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-08-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-11-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-07-31	1200	162	.0002	.0004	.0005	.0001	.0001L	.0007	.0005	.0001L
80-08-31	1200	162	.0001	.0001L	.0002	.0003	.0001L	.0001L	.0008	.0006
80-09-30	1200	162	.0001L	.0001	.0005	.0001L	.0001L	.0001L	.0006	.0001L
80-10-31	1200	162	.0001L	.0001L	.0038	.0001L	.0001L	.0002	.0019	.0001L

MAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 330U020J0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.045/31/00 LONG. 073/29/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : ST HUBERT A,QUE,CANSAP STATION. LOCATED AT AIRPORT ON THE EAST SIDE OF CITY OF MONTREAL. LAND USE THE IMMEDIATE AREA IS AGRICULTURAL.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L MEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
78-02-01	201	162	.0010L	.0010L	.0010
78-04-01	201	162	--	--	--
	1200	162	.0010L	.0100	.0010
78-07-01	1200	162	.0010L	.0010	.0010
78-08-01	1200	162	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0020
78-10-01	1200	162	.0010L	.0010L	.0010
78-11-01	1200	162	.0010L	.0010L	.0010L
80-07-31	1200	162	.0001L	.0003	.0003
80-08-31	1200	162	.0001L	.0001	.0003
90-09-30	1200	162	.0001L	.0009	.0008
80-10-31	1200	162	.0001L	.0023	.0005

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33QU03AA0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.049/49/00 LONG. 074/25/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : CHIBOUGAMAU A,QUE,CANSAP STATION LOCATED AT AIRPORT 12KM SSW OF TOWN OF12000. THERE ARE SEVERAL GOLD AND COPPER MINES IN THE AREA.CLOSEST ARE 9-15KM NE.POLLUTION IS NOTICABLE.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
78-02-01	1	162	.0260	.0090	.0020	.0020	.0010L	.0010L	.0200L	.0010L
78-06-01	1	162	.0290	.0100	.0010	.0010	.0010L	.0010L	.0200L	.0010L
78-07-01	1200	162	.0590	.0120	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-08-01	1200	162	.0400	.0030	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-09-01	1200	162	.0370	.0100	.0010	.0020	.0010L	.0010L	.0200L	.0010L
78-10-01	1200	162	.0010L	.0060	.0010L	.0010L	.0010L	.0010L	.0200	.0010L
78-11-01	1200	162	.0010L	.0070	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-02-01	1100	162	.0640	.0090	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
79-10-31	1100	162	.0260	.0030	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
	1101	162	.0480	.0070	.0010L	.0010L	.0010L	.0010L	.0600	.0010L
79-11-30	1100	162	.0120	.0020	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-01-31	1100	162	.0180	.0030	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
80-06-30	1200	162	.0338	.0026	.0001L	.0008	.0001L	.0003	.0020	.0001L
80-07-31	1200	162	.0450	.0098	.0006	.0009	.0012	.0001L	.0030	.0001L
80-08-31	1200	162	.0460	.0115	.0015	.0003	.0001L	.0001L	.0040	.0001L
80-09-30	1200	162	.0264	.0045	.0003	.0001L	.0004	.0001L	.0020	.0001L

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
78-02-01	1	162	.0010L	.0010L	.0030	.0010L	.0010L	.0010L	.0010L	.0020
78-06-01	1	162	.0010L	.0010L	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
78-07-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-08-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1200	162	.0010L	.0010L	.0010L	.0010L	.0010	.0010L	.0010L	.0010L
78-11-01	1200	162	.0010L	.0010L	.0030	.0010L	.0010L	.0010L	.0010L	.0010L
79-02-01	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
79-10-31	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010	.0010	.0010L	.0010L	.0010L	.0010L	.0010L
79-11-30	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0030	.0010L	.0010
80-01-31	1100	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001L	.0001
80-07-31	1200	162	.0002	.0003	.0005	.0002	.0001L	.0001L	.0001L	.0001
80-08-31	1200	162	.0001L	.0001L	.0012	.0011	.0001L	.0001L	.0004	.0002
80-09-30	1200	162	.0001	.0001L	.0008	.0006	.0001L	.0001L	.0002	.0001L

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33QU03AA0001
REGION/REGION - QUEBEC

LOCATION/LIEU - LAT.049/49/00 LONG. 074/25/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : CHIBOUGAMAU A,QUE,CANSAP STATION LOCATED AT AIRPORT 12KM SSW OF TOWN OF12000. THERE ARE SEVERAL GOLD AND COPPER MINES IN THE AREA.CLOSEST ARE 9-15KM NE.POLLUTION IS NOTICABLE.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18132L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
78-02-01	1	162	.0010L	.0010	.0020
78-06-01	1	162	.0010L	.0010L	.0010
78-07-01	1200	162	.0010L	.0010L	.0010
78-08-01	1200	162	.0010L	.0010L	.0010L
78-09-01	1200	162	.0010L	.0010L	.0010
78-10-01	1200	162	.0010L	.0010L	.0010
78-11-01	1200	162	.0010L	.0010L	.0010
79-02-01	1100	162	.0010L	.0010L	.0010L
79-10-31	1100	162	.0010L	.0010L	.0010L
	1101	162	.0010L	.0010L	.0010L
79-11-30	1100	162	.0010L	.0010	.0030
80-01-31	1100	162	.0010L	.0010L	.0010L
80-06-30	1200	162	.0001L	.0001L	.0001
80-07-31	1200	162	.0001L	.0001L	.0002
80-08-31	1200	162	.0001L	.0005	.0022
80-09-30	1200	162	.0001L	.0002	.0006

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33SA05MA0001
REGION/REGION - SASKATCHEWAN

LOCATION/LIEU - LAT.051/46/00 LONG. 104/12/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : WYNYARD, SASKATCHEWAN WMO BACKGROUND AIR POLLUTION STATION SAMPLER LOCATED AT WEATHER STATION EDGE OF SMALL TOWN.LAND USE GRAIN- LIVESTOCK.VERY DUSTY IN SUMMER.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18077L ALPHA-BHC	18072L GAMMA-BHC (LINDANE)	18053L ALPHA-ENDOSULFAN	18057L BETA-ENDOSULFAN	18033L P,P-METHOXY-CHLOR	17810L HEXACHLORO-BENZENE	18176L AROCLORS TOTAL (PCB'S)	18126L MIREX
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1300	162	.0740	.0130	.0010L	.0010L	.0010L	.0010L	.0200L	.0010L
78-01-01	201	162	.0370	.0380	.0010L	.0010L	.0010L	.0010	.0300	.0010L
78-06-01	1400	162	.0710	.0290	.0010	.0010L	.0320	.0010L	.0200L	.0010L
78-08-01	1400	162	.0340	.0130	.0010L	.0010	.0010L	.0010L	.0200L	.0010L
78-09-01	1300	162	.0580	.0130	.0010L	.0010L	.0010L	.0010L	.0200	.0010L
78-10-01	1300	162	.0870	.0080	.0010L	.0010L	.0010L	.0010	.0200L	.0010L
79-01-31	1200	162	.0340	.0400	.0010L	.0010L	.0010L	.0010	.0400	.0010L
79-10-01	1200	162	.0410	.0080	.0010L	.0010L	.0010L	.0010	.0200L	.0010L
80-06-30	1200	162	.0282	.0077	.0004	.0001L	.0005	.0001	.0010L	.0001L

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18022L P,P-DDE	18024L P,P-TDE	18004L P,P-DDT	18007L O,P-DDT	18042L HEPTACHLOR	18047L HEPTACHLOR EPOXIDE	18062L ALPHA-(CIS) CHLORDANE	18067L GAMMA-(TRANS) CHLORDANE
YR-MO-DY			UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
77-08-01	1300	162	.0010L	.0010L	--	.0010L	.0010L	.0010L	.0010L	.0010L
78-01-01	201	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010
78-06-01	1400	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-08-01	1400	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-09-01	1300	162	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L	.0010L
78-10-01	1300	162	.0010L	.0010L	.0030	.0010L	.0010L	.0010	.0010L	.0020
79-01-31	1200	162	.0010	.0010L	.0010	.0010L	.0010L	.0010	.0010L	.0020
79-10-01	1200	162	.0010L	.0010L	.0020	.0010L	.0010L	.0010	.0010L	.0010
80-06-30	1200	162	.0001L	.0001	.0011	.0002	.0001L	.0001L	.0001	.0001

NAQUADAT
DETAILED REPORT / RAPPORT DETAILLE

STATION/STATION - 33SA09HA0001
REGION/REGION - SASKATCHEWAN

LOCATION/LIEU - LAT.051/46/00 LONG. 104/12/00
WATER TYPE/TYPE D'EAU - PRECIPITATION (MIXED PRECIPITATION)

NARRATIVE/DESCRIPTION : WYNYARD, SASKATCHEWAN HMO BACKGROUND AIR POLLUTION STATION SAMPLER LOCATED AT WEATHER STATION EDGE OF SMALL TOWN.LAND USE GRAIN- LIVESTOCK.VERY DUSTY IN SUMMER.

DATE/ DATE	TIME/ HEURE	SUB-ID/ SOUS-ID	18192L ALDRIN	18142L ENDRIN	18152L HEOD (DIELDRIN)
YR-MO-DY			UG/L	UG/L	UG/L
77-08-01	1300	162	.0010L	.0010L	.0010L
78-01-01	201	162	.0010L	.0010L	.0010
78-06-01	1400	162	.0010L	.0010L	.0010
78-08-01	1400	162	.0010L	.0010L	.0010L
78-09-01	1300	162	.0010L	.0010L	.0010L
78-10-01	1300	162	.0010L	.0010L	.0010
79-01-31	1200	162	.0010L	.0010L	.0770
79-10-01	1200	162	.0010L	.0010L	.0010
80-06-30	1200	162	.0001L	.0003	.0002

FOOTNOTE: L - LESS THAN DETECTION LIMIT G - GREATER THAN MEASUREMENT LIMIT
NOTEZ BIEN: L - PLUS PETIT QUE LA LIMITE DE DETECTION G - PLUS GRAND QUE LA LIMITE MESURE