

Notice of Project Update

Hamilton International Airport – Off-Site Risk Assessment

April 2022

Dear Area Residents and Community Members:

Transport Canada and Public Services and Procurement Canada have retained Arcadis Canada Inc. (Arcadis) to conduct an environmental risk assessment, which includes the evaluation of human health and ecological risks, to further investigate the presence and distribution of per- and polyfluoroalkyl substances (PFAS) in the Welland River watershed, downstream from former fire fighting training areas at the Hamilton International Airport (HIA). PFAS are a class of chemicals that have been used since the 1950s in numerous commercial and industrial products including aqueous fire-fighting foams used at fire-fighting training centres.

You may be aware of this study from the previous two project notices which were circulated in July 2016 (Notice of Current Project) and July 2019 (Notice of Project Update) to property owners and other groups with an interest in the multiple stage risk assessment study that is being conducted for the areas downstream of the HIA.

Risk Assessment

The risk assessment (RA) study is being conducted in multiple stages with the purpose of providing a better understanding of current site conditions and any potential risks to human and ecological (e.g., wildlife, fish) health associated with PFAS. The RA is intended to be completed in the spirit of the Ontario Ministry of the Environment, Conservation and Parks (MECP) RA requirements as per Ontario Regulation 153/04 (Records of Site Condition) (as amended) under the *Environmental Protection Act*. The RA study has been carried out in accordance with available guidance provided by federal agencies such as Health Canada, Federal Contaminated Sites Action Plan, Environment & Climate Change Canada as well as other reputable international jurisdictions. In addition, the MECP published PFAS guidance while the RA was underway; these values, along with other new guidance and science, will be used in future RA updates. The RA reports have been shared with the MECP and federal agencies, and their feedback has been used to plan Stage 3 RA work and update the RA report.

Stage 1 RA

The first stage of the RA study, which began in the fall of 2015, studied an area extending approximately 1.3 km downstream of the southern boundary of the HIA to just south of White Church Road (i.e., the “original RA Area”). Arcadis conducted several sampling programs including sediment, surface water, and biota tissue (e.g., fish, aquatic plants) in the original RA Area. The findings of the Stage 1 RA study indicated that more data and additional studies were needed to understand the current site conditions and potential risks to human and ecological health.

Stage 2 RA

Arcadis initiated the second stage of the RA in April 2017, which continued through the summer and fall of 2017 and the spring of 2019. Additional data was collected to refine the RA Area and study. The RA Area limits were expanded beyond the original RA Area to include the Welland River downstream to Lake Niapenco, and Lake Niapenco and the lands immediately adjacent to those waterbodies. The expanded RA Area was divided into 3 sub-areas (i.e., RA Area 1, RA Area 2 and RA Area 3). The enclosed map (Attachment A) shows both the original and expanded RA Area and sub-areas. Data available from other sources, such as the MECP and SNC-Lavalin Inc., were also utilized in the second stage of the RA study.

The Stage 2 RA concluded that there are no health concerns related to direct contact with soil, surface water and sediment in the RA Area. Furthermore, no health concerns were identified related to consumption of locally harvested vegetation and beef sourced from areas south of White Church Road. However, the RA has identified potential concerns related to consumption of locally harvested vegetation, beef, and fish in some areas. The RA conclusions regarding these potential concerns and recommended further studies are as follows:

- 1) **Consumption of local harvested plants and locally-sourced beef.** The RA identified potential concerns related to consumption of crops and beef raised locally. However, because the actual PFAS concentrations in local crops or beef have not been collected, they had to be estimated in the RA. The RA estimates used cautious assumptions, such as the cattle obtaining most of their feed, year-round, from grass along creek banks near the airport rather than from an off-site grain supplier or from grazing in areas further away from the creek banks, and that harvested plants are grown along the creek banks. The RA also assumed that residents get half of their beef from local sources, eating it three times per week, as well as eating harvested plants on a daily basis. The results do not suggest that immediate action is necessary at this time. However, further studies have been recommended involving collection of more information and more detailed evaluations of these potential concerns.
- 2) **Consumption of local fish from watercourses in the expanded RA Area.** The RA identified potential concerns related to the consumption of fish caught from the Welland River extending from the HIA to Lake Niapenco, and fish caught from Lake Niapenco itself. In the RA calculations, Arcadis made assumptions about the amount of fish eaten by residents and recreational users, and about how much of it was caught locally (i.e., from local streams and Lake Niapenco). The Stage 2 RA recommends that a dietary survey of residents in the RA Area be conducted, to better understand the local fish consumption patterns and improve future risk estimates.

Based on the findings of the Stage 2 RA, it is recommended that residents and recreational users limit the amount of fish consumed from the local area. One available tool is the MECP Guide to Eating Ontario Fish (found at <https://www.ontario.ca/environment-and-energy/eating-ontario-fish>), which contains recommended limits on eating fish caught from Lake Niapenco and the Welland River upstream of Lake Niapenco. The Stage 2 RA calculations did not take the MECP fish advisory into account when evaluating risk from fish ingestion; it conservatively assumed that anglers were not following the advisory. It also assumed that residents in the RA Area could be exposed to PFAS through multiple sources, not only fish ingestion. In view of the differences between the approach taken in the RA and the current understanding of the MECP fish advisory, the Stage 2 RA recommended that people consuming fish from the RA area consume a lesser number of meals than is recommended by the MECP fish advisory. Specifically, the Stage 2 RA recommended that individuals consuming fish from the RA area consume only:

- 30% of the recommended number of meals per month in the MECP fish advisory for the general population, for each fish species, and

- 14% of the recommended number of meals per month in the MECP fish advisory for sensitive populations, which include women of child-bearing age and children under 15, for each fish species.

If these modifications are applied to the recommendations in the MECP fish advisory, the recommended number of meals per month would be reduced. The reduced number of meals is presented in the enclosed Attachment B.

Regarding ecological health, the Stage 2 RA identified potential concerns for wildlife (e.g., muskrat, great blue heron, mink) that feed on fish and/or other aquatic organisms. Potential concerns were identified for two bird species at risk that need protection at individual levels. This includes bobolink (i.e., a medium-sized songbird), which feed mainly on terrestrial vegetation and insects and barn swallow (i.e., aerial foraging bird) which mainly feed on flying insects during flight over open land and water. For two aquatic species at risk, grass pickerel and mapleleaf mussel (both are provincially listed "Special Concern" species), due to lack of available toxicological information, no conclusion on potential ecological health concerns could be reached. The Stage 2 RA recommended habitat and/or population surveys for these species.

The conclusions of the Stage 2 RA are considered conservative (in other words, they lean on the side of caution and often result in overestimates of risk). Additionally, further studies have been recommended to evaluate whether any action is needed.

Next Steps

Stage 3 RA work is now being planned. It will implement the recommendations made in the Stage 2 RA, including field studies, surveys of local residents (e.g., water well use, farming activity, and food and fish consumption), and updating of the RA calculations to take into account the new information in order to reduce the conservative assumptions and sources of uncertainties identified in the Stage 2 RA. The Stage 3 RA will also incorporate new science that has become available since the commencement of the Stage 2 work, including the new guidance from the MECP.

A plain language summary of the RA is currently being prepared. If you are interested in receiving a copy, once available, please contact the email address provided below.

If you have any questions or concerns about the material presented in this letter, please contact the project team at: HamiltonOffsiteRAInfo@arcadis.com. Your e-mail will be forwarded to the appropriate individual, who will contact you with a response.

Sincerely,

Arcadis Canada Inc.

Consultant Team for Public Services and Procurement Canada and Transport Canada

Attachment A: Figure - Risk Assessment and Study Areas

Attachment B: Recommended local fish meals per month based on MECP Fish Advisory

Frequently Asked Questions (FAQs) – Risk Assessments and PFAS:

What is a risk assessment and what is the purpose of conducting an assessment?

A risk assessment (RA) is a scientific process that evaluates the likelihood of unacceptable risks to people or the environment as a result of exposure to contaminants (i.e., chemicals) present in the soil, surface water, sediment, groundwater or biota tissue.

If risks to human health and the environment are identified, a risk assessment will help determine whether, and to what extent, remediation or risk management measures are needed.

What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a family of man-made chemicals used for decades to make products that resist heat, oil, stains, grease and water. Common uses of PFAS include non-stick cookware, stain resistant carpets and fabrics, food package coatings and some industrial applications. Some PFAS were components in certain aqueous fire-fighting foams.

How are people exposed to PFAS?

Because these chemicals have been used for decades, PFAS are found widely at low levels in the land and water environments around the world. People are exposed to small amounts of PFAS in everyday life through exposure to dust, indoor and outdoor air, food, water and contact with consumer products that contain these chemicals.

What are the health effects of exposure to PFAS?

Scientists are still researching the health effects of exposure to PFAS in humans. Several laboratory animal and human studies have been undertaken. Some human studies have shown health effects associated with 1) interference with the body's natural hormones, 2) increase in cholesterol levels, 3) effects on the immune system, and 4) increased risk of some cancers. The animal studies suggest changes in liver, thyroid and pancreatic function as well as changes in hormone levels. Further studies are required to completely understand the health effects of exposure to PFAS in humans.

Why was the Study Area selected, and what is the difference between the RA Area and the Study Area limits (as identified on the study map)?

The Study Area (see enclosed map) was selected because it encompasses the Upper Welland River watershed, which includes tributaries that drain from the former fire fighting training areas at the airport to Lake Niapenco.

The RA Area (see enclosed map) is a smaller area located within the Study Area, and it was selected due to its localized proximity to and potential to be influenced by the former fire fighting training areas at Hamilton Airport. The RA Area has expanded since the beginning of this study. This was done to ensure that it continues to reflect the potential limits of the area that may have been influenced by historical activities at the former fire fighting training areas as data continues to be collected. The RA Area limits may continue to change as new data becomes available.

Why has the risk assessment been conducted in multiple stages?

The RA Area is a large area and it requires significant data and resources to properly understand the current conditions. A multiple stage risk assessment study was considered most appropriate to provide efficient and reliable conclusions. The field work programs were done in stages to concentrate efforts on specific areas where preliminary data indicated that attention is needed to better understand site conditions and potential human and ecological health issues. Each stage of the risk assessment study has been submitted to federal and provincial regulatory agencies for review.

Frequently Asked Questions (FAQs) – Risk Assessments and PFAS:**Why is the risk assessment study taking so long?**

The risk assessment is a lengthy process as it is dependent on inputs and results from the field work programs, which face constraints such as access permits and seasonality, which can delay completion. The multiple-stage risk assessment approach and consideration of the review and input of multiple regulatory agencies also add to the duration of the risk assessment process.

Why is further investigation of the exposure from consumption of local produce and beef required?

Risk estimates related to local produce consumption were based on limited plant tissue sampling as well as estimating concentrations in edible plants and beef from soil exposure by modelling, instead of measuring them directly. Modelling concentrations from soil relies on literature-based information about how PFAS “transfers” from soil to various plants or cattle. In order to manage uncertainties in this data, the risk assessment used conservative assumptions in the modelling, resulting in conservative estimates of plant and beef tissue concentrations. Based on these conservative plant tissue concentrations (which assumed that vegetation consumed by people and cattle was grown along the creek banks), the RA results suggest some potential risks related to long-term exposure to local produce and beef sourced from the RA Area north of White Church Road. Given the uncertainty and conservative nature of the approach taken, surveys are recommended to identify areas of local vegetable gardens, local beef grazing areas, and the frequency of local food consumption from the RA Area, as well as additional local vegetable tissue sampling to reduce the level of conservatism in estimating food exposure.

Have you considered exposure to PFAS via consumption of local dairy?

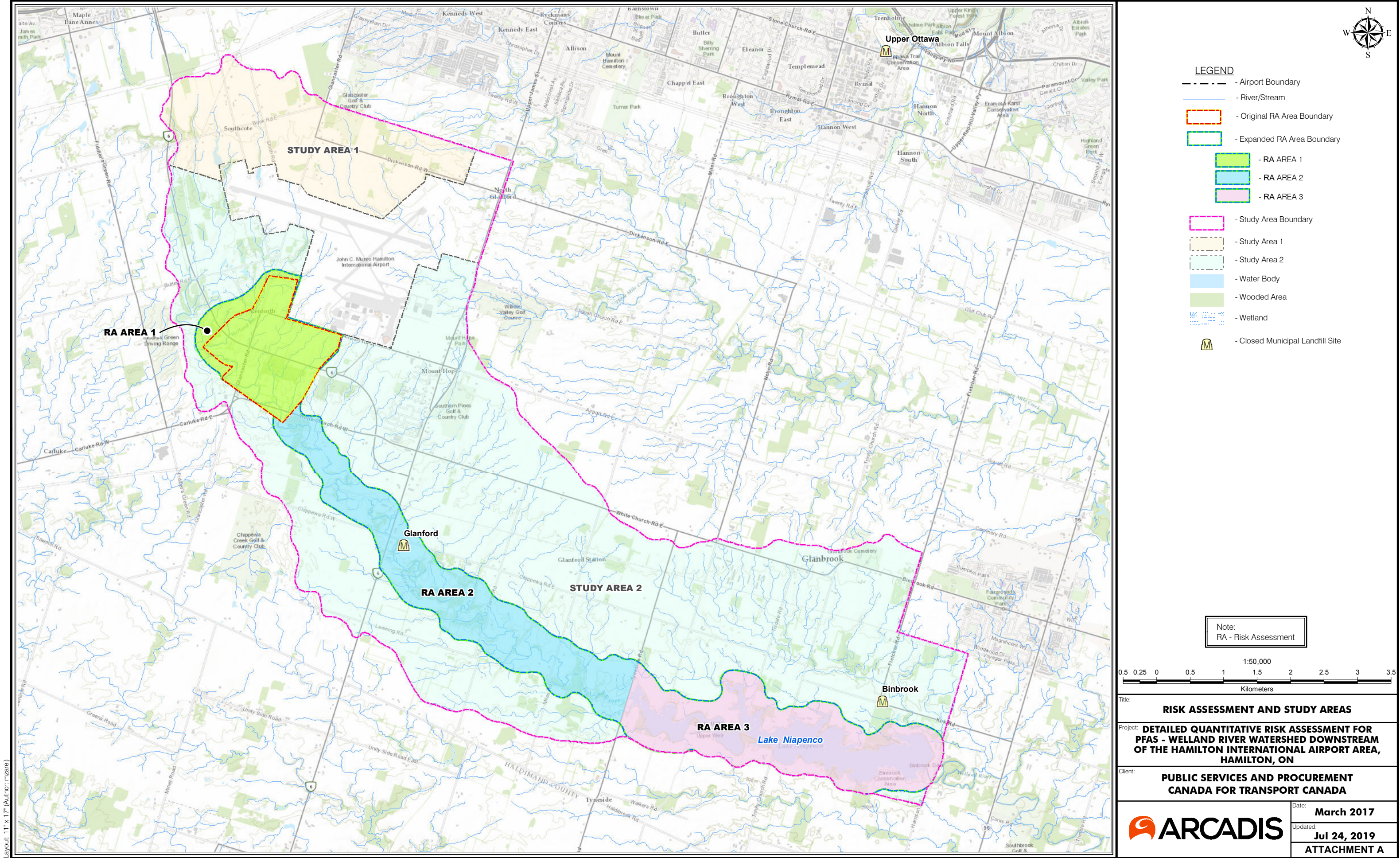
The current risk assessment did not consider resident's exposure to PFAS via consumption of local dairy milk due to a general lack of scientific information about transfer of PFAS from soil to dairy milk. The current risk assessment recommends verifying the presence of dairy cows in the RA Area and gathering information about the milk consumption patterns from any on-site dairy cows. Sampling of locally raised dairy milk is also recommended if the presence of dairy cows in the RA Area is confirmed.

Can we eat local produce and farming products in the meantime until you conduct further studies to finalize the risk assessment?

The potential concerns identified in the current risk assessment were estimated for individuals who obtain a large portion of their diet from locally grown produce and beef. The risk assessment uses conservative assumptions in the exposure estimates which lean on the side of caution. The current understanding of locations of PFAS contamination in the RA Area suggests that as long as the grazing areas of cattle and the source area of local produce are not in close proximity to watercourses (i.e., along the creek banks), the consumption of beef and produce sourced from RA Area is not likely to be of concern.



Attachment A - Risk Assessment and Study Areas



Attachment B – Recommended local fish meals per month based on MECP Fish Advisory

The Stage 2 RA recommended that individuals consuming fish from the RA area consume only:

- 30% of the recommended number of meals per month in the MECP fish advisory for the general population, for each fish species, and
- 14% of the recommended number of meals per month in the MECP fish advisory for sensitive populations, which include women of child-bearing age and children under 15, for each fish species.

If these modifications are applied to the recommendations in the MECP fish advisory, the recommended number of meals per month would be reduced, and would now be:

- For fish caught from **Lake Niapenco**, a small number of meals of one of the following fish may be eaten in a month. The number of meals depends on the size of the fish:
 - o Brown bullhead (1-3 meals per month for general population and 0-1 for sensitive population); or
 - o Common carp (0-2 meals per month for general population and 0-1 for sensitive population); or
 - o Northern pike (1-4 per month for general population and 0-2 for sensitive population); or
 - o Pumpkinseed (3 per month for general population and 1 for sensitive population); or
 - o White crappie (1 per month for general population and 0 for sensitive population); or
 - o Yellow perch (2 per month for general population and 1 for sensitive population).
- For some other fish species caught in **Lake Niapenco**, fewer than one meal per month should be eaten. The number of meals depends on the size of the fish:
 - o Black crappie (7 per year for general population and 0 for sensitive population); or
 - o Channel catfish (7 per year for general population and 0 for sensitive population); or
 - o Largemouth bass (7 per year for general population and 0 for sensitive population); or
 - o Smallmouth bass (3-7 per year for general population and 0 for sensitive population); or
 - o Some sizes of common carp, northern pike and white crappie (see tables for details).
- For fish caught in the **Welland River upstream of Lake Niapenco**, 2-3 meals of black crappie can be eaten 2-3 times per month by the general population, and 1 meal per month of black crappie may be eaten by sensitive populations. If the other fish in the advisory are caught (brown bullhead, common carp, green sunfish or northern pike), one of these types of fish can be eaten instead of black crappie, but the total eaten should be fewer than one meal per month of these fish. The number of meals depends on the size of the fish:
 - o Brown bullhead (3 per year for general population and 0 for sensitive population); or
 - o Common carp (3-7 per year for general population and 0 for sensitive population); or
 - o Green sunfish (3 per year for general population and 0 for sensitive population); or
 - o Northern pike (3 per year for general population and 0 for sensitive population).