



Lower Grasse River Project Status Update

Massena, New York
Winter 2008

CHECK IT OUT!
The project website has
been updated -
Please visit us at
www.thegrasseriver.com

This winter 2008 update provides information regarding the current status of projects recently undertaken by Alcoa in the lower Grasse River. These include the: 2007 Ice Breaking Demonstration Project; ongoing Ice Management Evaluation; and monitoring associated with the 2006 Activated Carbon Pilot Study. Also included here is an update on river-wide polychlorinated biphenyl (PCB) trends in fish as well as the anticipated path forward for the project. The latest project news is included on the Grasse River project website (www.thegrasseriver.com).

This issue also contains a special insert that presents a pictorial timeline of historical and ongoing river projects to promote an understanding of the Superfund process and how all of the pieces fit together to support the development of a long-term remedial approach to address PCBs in the lower Grasse River.

2007 Ice Breaking Demonstration Project Summary – No Ice Breaking in 2008



At the direction of the United States Environmental Protection Agency (EPA), Alcoa conducted an Ice Breaking Demonstration Project March 19-24, 2007 which included breaking the intact ice cover over an approximate 7-mile stretch of the lower Grasse River. The intent of the Demonstration Project was to open a channel in the river to allow ice entering from upstream of Massena during natural ice breakup to freely flow through the lower Grasse River without causing significant jamming. This would then reduce the potential for related sediment scour (as was observed in 2003).

- Ice Breaking Demonstration Project community notification program components:
- Community meetings
 - Announcements in local papers and on local radio and television stations
 - Distribution and posting of community mailers and flyers
 - Announcements at local community group meetings, schools, local businesses, and community centers
 - Door-to-door visits with residents along the lower Grasse River
 - Installation of warning signs and lights at river access/egress points
 - Posting of banners on bridges over the lower Grasse and Raquette Rivers

Safety of the community and personnel involved with ice breaking and monitoring activities, along with the protection of the surrounding environment, were critical considerations during the planning and implementation of the Demonstration Project. Alcoa, working in conjunction with EPA, developed and implemented an extensive community notification program (see inset) and developed emergency planning and response procedures to inform and protect the community.



Ice breaking was performed using two excavators operating from a barge that was moved by a tug. Two crews worked alternating 12-hour shifts, 24 hours per day to complete the work. Progress during each shift was dependent on river conditions including ice



thickness, river flows, air temperature, wind speed, and river course. These conditions influenced the ability to successfully clear ice from the channel once it was broken, and backtracking was required on several occasions to clear and widen the channel that had become clogged with pieces of ice or where ice had reformed. Five days of ice breaking were needed to break a channel approximately 200-250 feet wide throughout the river, and natural ice out of the lower Grasse River occurred approximately 5 days later.



There were no community or worker health and safety incidents during ice breaking operations. However, on four separate occasions, individuals were observed on the ice and operations were stopped until it was confirmed that it was safe to continue. Focus group meetings and surveys were conducted after the Demonstration Project to

understand community reaction to the project and evaluate the effectiveness of the community notification measures. In general, survey participants noted a major concern about the potential for a snowmobile accident occurring as a result of the project, and extensive public notification was the considered the best way to guard against this possibility. Other major concerns included noise at night, shortened winter recreational season, environmental disturbance, and worker safety. Participants indicated that the notification procedures implemented by Alcoa and EPA were comprehensive and effective.

Although the ice breaking was successfully completed, based on experiences and observations from the Demonstration Project, EPA has decided to not pursue the use of ice breaking as an interim ice control measure. As a result, there will be **no ice breaking activities in 2008 in the lower Grasse River.**

Alcoa is currently evaluating other ice control measures for use in the lower Grasse River (see below). If another ice-jam event occurs prior to implementation of an ice control measure or remedial activities, Alcoa anticipates that, based on results from the 2003 ice-jam event, no significant changes in river-wide PCB levels in the water column and fish would be observed, although some localized effects are possible.

Ongoing Ice Control/Management Options Evaluation

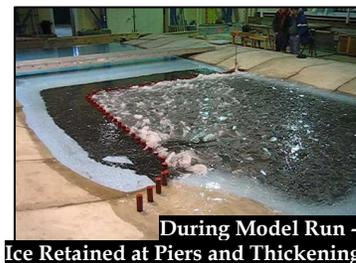
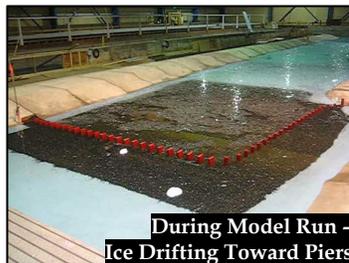
Alcoa has spent significant time and effort to determine the best approach to use for managing ice in the lower Grasse River. Efforts commenced immediately after the 2003 ice jam and related effects were identified. Currently, two separate long-term ice control options are under evaluation, as described below.

1. A location in the lower Grasse River adjacent to the Alcoa West facility has been selected as potentially feasible for installation of an ice control structure (ICS). A pier-type ICS is under consideration at this location. The pier-type ICS stops ice at the piers, but allows river flow to pass beneath the ice or through an adjacent floodplain or bypassed channel.
2. Alcoa has been working with the Massena Electric Department (MED) to evaluate the feasibility of a multi-purpose project that could provide ice management, hydroelectric power, and recreational benefits for the community through restoration of upstream water levels to those that existed prior to the breach of the weir in the Village of Massena. Alcoa is currently providing support to MED through the initial study phases for the project. The MED hydroelectric project is also currently in a process under the oversight of the Federal Energy Regulatory Commission (FERC).



Several studies have been conducted to support evaluation of each project, including:

- State-of-the-art computer-based modeling at Clarkson University; and
- Construction and testing of a large-scale model of the lower Grasse River ICS site and MED hydroelectric dam site in a specially designed refrigerated testing facility at the United States Army Corps of Engineers Cold Regions Research Engineering Laboratory (CRREL).



Results of the modeling and engineering evaluations are being compiled and evaluated. Alcoa will continue evaluating these options and will present all findings to EPA. EPA will ultimately decide whether ice management will be incorporated into the final remedy for the lower Grasse River.

Activated Carbon Pilot Study Update

As first described in the September 2006 community mailer, Alcoa performed the Activated Carbon Pilot Study during September and October 2006 to evaluate the effectiveness of applying and mixing activated carbon in sediments of the lower Grasse River. The study consisted of adding activated carbon to the upper layer of sediments using specially designed equipment, along with monitoring for an additional two years. Monitoring was conducted in 2007 to determine the longer-term effects of carbon treatment. Activities included:

- Sediment sampling to establish the effectiveness of the application techniques in getting the activated carbon into the river sediments;
- Field and laboratory studies to measure the effectiveness of the activated carbon in reducing the amount of PCBs absorbed from Grasse River sediments by river organisms (i.e., equilibrium and desorption testing of sediments, testing of microorganisms exposed to the treated sediments for 14 days);
- Benthic community sampling to determine the effects of carbon application on the presence and quantity of these organisms; and
- Testing the potential of Grasse River sediments treated with activated carbon to erode under certain conditions.



Laboratory testing of the samples collected this fall is currently ongoing. Results will be evaluated and presented to EPA mid-2008, and subsequently made available to the public.

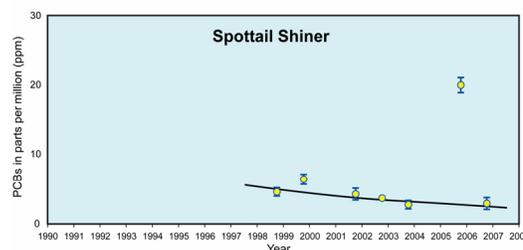
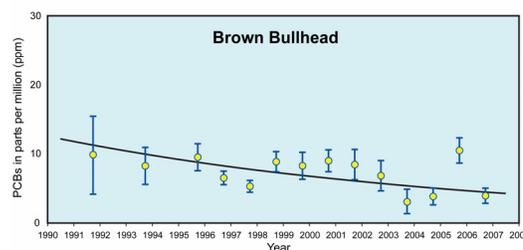
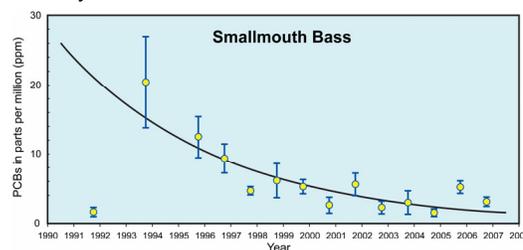
Review of Grasse River Fish Trends Over Time

Since the early 1990s, Alcoa has collected more than 2,100 resident fish samples from the lower Grasse River. Smallmouth bass, brown bullhead, and spottail shiner are collected annually to examine how PCB levels in the lower Grasse River have changed over time, and to identify what impacts naturally-occurring events (such as high flow events and ice jams) and major in-river pilot studies have on the recovery of the lower Grasse River.

The resident fish data indicate that PCB levels in the river have dramatically declined since the early to mid-1990s. This decline is likely due to two factors:

1. A downward trend in water column PCB concentrations resulting from the land-based remediation efforts performed at the Alcoa plant site between 1990 and 2001 that significantly reduced the PCB discharges to the river; and
2. Natural recovery due to “clean” solids that continually enter the river from upstream and deposit on top of the PCB-containing sediments, reducing movement of PCBs to fish.

The observed decline in PCBs continued through a 100-year high flow event that occurred in January 1998, construction activities associated with the 2001 Capping Pilot Study and 2006 Activated Carbon Pilot Study, and the severe ice-jam event that occurred in 2003 (some local impacts were observed). Sediment removal performed as part of the 2005 Remedial Options Pilot Study (ROPS) caused increases in resident fish PCB levels, but these increases only resulted in the short-term interruption of the decline observed prior to 2004. PCB levels measured in 2006 were similar to those measured in the few years prior to 2005. The 2007 fish data have recently been received and will be included on the website pending review by EPA.



Lower Grasse River Project Path Forward

The lower Grasse River project is being conducted under the Superfund Process with EPA as the lead Agency. Additional details on this process are presented in the attached poster (Grasse River: Working Toward Our Goal... One Step at a Time). Alcoa is currently working to prepare a revised Feasibility Study (Analysis of Alternatives) for submittal to EPA in the first quarter of 2009. Once this report is reviewed and finalized, EPA will issue a proposed remedy. Two recent documents [one developed by EPA and the other by the National Academy of Sciences (NAS)] relevant to the evaluation of sediment site management options are available on the Internet for those interested in obtaining additional information on the benefits and limitations of the available remedial approaches (see inset). The referenced NAS report includes discussion of data collected during the ROPS that was conducted on the Grasse River in 2005. Public involvement throughout this process is an important consideration. Stay tuned for opportunities to become involved.

Recently released documents available for more information on sediment management options include:

- EPA released the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (December 2005) which provides technical and policy guidance for making decisions at contaminated sediment sites.
<http://www.epa.gov/superfund/health/conmedia/sediment/pdfs/guidance.pdf>
- NAS reviewed 26 environmental dredging sites and evaluated the effectiveness of dredging as a remedial option. The findings are presented in *Sediment Dredging at Superfund Megsites: Assessing the Effectiveness* (June 2007).
http://www.nap.edu/catalog.php?record_id=11968#toc

For More Information

If you would like additional information or want to be added to the project mailing list, please contact:

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Bruce Cook (Alcoa On-site Manager)	(315) 764-4270

Additional project information is also available on Alcoa's Grasse River website at www.thegrasseriver.com.

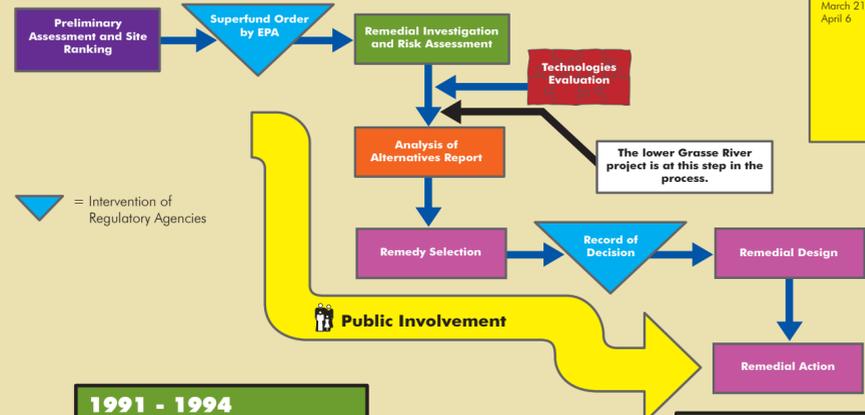
**88 PARKER AVENUE
MASSENA, NY 13662**



Grasse River: Working Toward Our Goal... One Step at a Time

The Superfund Process

The goal of the Superfund Program is to protect human health and the environment at locations where potential risks may exist as a result of historical operations.



Public Meetings/Availability Session	Community Advisory Panel (CAP) Meetings
2008 to Future Dates to be determined 2007 January 30 2006 March 29 2005 April 11-12 2004 June 2-3 2002 February 4-6 2001 July 9	(This Panel provides a formal forum through which the community can express its interests and concerns regarding the Grasse River project.) 2008 to Future Dates to be determined 2005 February 23 July 20 November 9 2007 January 30 March 14 April 19 2006 March 28 September 27 2003 February 12 May 27 June 24 September 30 2002 February 5 April 9 May 8 June 5 October 1 November 20 2001 April 18 May 24 July 9 August 15 October 11 October 23 December 6

2005
 Remedial Options Pilot Study (ROPS) – included a combination of dredging (25,000 cy), capping (~7 acres), thin-layer capping (~0.5 acre), and armored capping with a stone layer (~1 acre) to provide information related to the effectiveness of potential remedial alternatives specific to the lower Grasse River.

2008 - 2009
 Revised Analysis of Alternatives Report being prepared.
 • Document will incorporate site-specific findings from the spring 2003 ice-jam event, subsequent ice investigations, 2005 ROPS, 2006 ACPS, 2007 Ice Breaking Demonstration Project, ongoing Ice Management Evaluations, and additional sampling since 2002 (to be incorporated into updated Addendum to the Comprehensive Characterization of the Lower Grasse River Report).
 • Anticipate that the revised report will be submitted to EPA in early 2009.

The future...



Future Activities

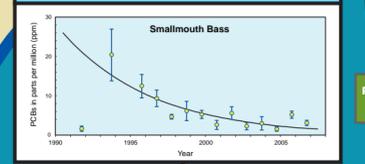
- EPA will evaluate the remedial alternatives included in the revised Analysis of Alternatives Report.
- EPA will issue a Proposed Remedial Action Plan describing the cleanup plan it believes should be implemented for the river.
- Proposed cleanup plan will be made available for public comment and EPA will hold at least one public meeting to talk through the plan.
- Following the public comment period, EPA will issue the Record of Decision specifying the cleanup approach.

Future Activities

Once EPA selects the remedy and releases the Record of Decision, Alcoa will develop a Remedial Design to implement the remedy and then begin the Remedial Action.

1991 - 1994
 Performed Phases I and II of the River and Sediment Investigation.
 • Studies included evaluation of the biological, chemical, ecological, and hydraulic processes at work in the river.
 • Investigation results summarized in the Comprehensive Characterization of the Lower Grasse River Report (available in the Massena Public Library).

1990 - Future (as necessary)
 New York State Department of Health issued a lower Grasse River fishing advisory warning against eating any fish caught between the Massena Power Canal and the St. Lawrence River.
 • Annual monitoring is currently being performed to track trends in polychlorinated biphenyl (PCB) levels in fish (see Review of Grasse River Fish Trends Over Time in the Community Update for more information).

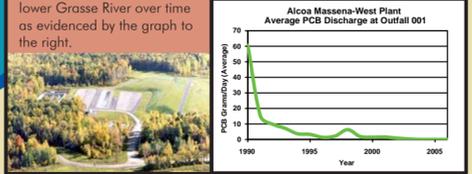


1993
 Risk Assessment prepared in 1993 (and updated in 2002).
 • PCBs identified as the primary chemical of concern with consumption of fish containing PCBs posing the greatest potential risk.
 • Reducing PCBs in fish is the primary goal of Grasse River cleanup activities.

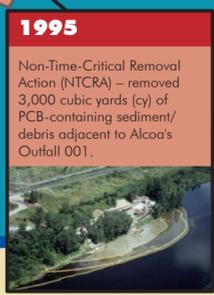
1996 - Future
 Supplemental Remedial Studies (SRS) monitoring activities are tracking changes in the river over time.
 • Studies include annual water and fish sampling, and various sediment sampling events.
 • Studies indicate that to reduce PCB levels in fish, PCB levels in the top few inches of the sediment need to be reduced as this is where PCBs enter the food chain. For this reason, remedial technologies typically focus on addressing sediments in order to reduce fish PCB levels.

1989
 EPA (the lead Agency for the project) issued an Administrative Order to Alcoa for the lower Grasse River.
 The order required that Alcoa investigate potential environmental impacts on portions of the Grasse River, evaluate potential remedial solutions, and implement the selected solution.

1991 - 2001
 Implemented land-based remedial efforts at the Alcoa Massena West Plant, including source control measures (a critical step in any remedial strategy), which have successfully reduced the discharge of PCBs to the lower Grasse River over time as evidenced by the graph to the right.



1995
 Non-Time-Critical Removal Action (NTCRA) – removed 3,000 cubic yards (cy) of PCB-containing sediment/debris adjacent to Alcoa's Outfall 001.



2001
 Capping Pilot Study (CPS) – capping (e.g., placing a clean layer of materials over PCB-containing sediments) was performed over ~7 acres of the Grasse River using various placement techniques and material types.

2003
 Ice jam occurred in spring 2003 that caused a loss of cap material placed as part of the 2001 CPS and, in some areas, underlying sediment. This ice jam scour mechanism was not previously known to occur and the cap installed as part of the CPS was not designed to withstand the forces from these events.
 • Resulted in additional investigation and sampling activities, which showed that ice jams capable of scouring and redistributing PCBs buried in the river sediments can occur in the upper ~1.8 miles of lower Grasse River (i.e., between the Power Canal and just upstream of the Route 131 Bridge).
 • The 2003 ice-jam event did not result in significant changes in river-wide PCB levels in the water column or fish, although some localized effects were observed.
 • Also resulted in Ice Management Evaluations, ongoing since 2003 (see box to right, 2003 - Future).

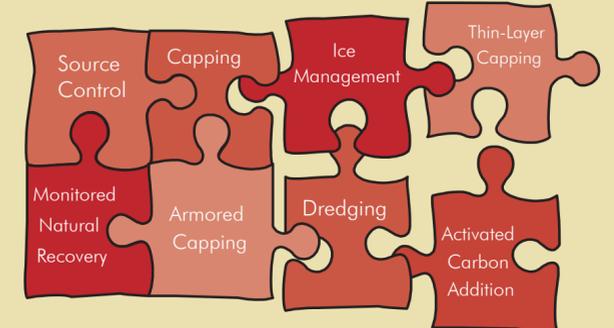


2002
 Analysis of Alternatives Report published (available in the Massena Public Library).
 • Evaluated 10 remedial options that included various combinations of the primary solutions identified in the puzzle below.

2003 - Future
 Ice Management Evaluations – an evaluation of short- and long-term options for controlling the potential for future ice-jam events is ongoing.
 • The only feasible non-structural short-term option identified was mechanical ice breaking (see 2007 Technologies Evaluation box).
 • Longer-term options include a pier-type stand-alone ice control structure (ICS) on the river near the Alcoa Massena West Plant operations, possible integration of ice control into the Massena Electric Department (MED) proposed hydropower project if approved by the Federal Energy Regulatory Commission (FERC), and/or installation of an armored cap with a stone layer designed to withstand ice-jam related scour forces in the river.

Technologies Evaluation

Primary remedial solutions available for addressing PCBs in sediments include natural recovery, capping, dredging (removal), and innovative approaches such as adding activated carbon to sediments to bind up PCBs. These options can be used alone or in combination to develop a viable remedial alternative for the river. To develop site-specific information on remedial solutions for the river, Alcoa has focused most of the project activity since 2000 on conducting several in-river pilot studies (see timeline). Although implementing these pilot studies takes time to perform and can be costly, results from these studies are critical in evaluating the potential solutions and reducing uncertainty in the Superfund decision-making process.



For more information on the Grasse River project, please visit the website www.thegrasseriver.com.