

Columbia River

Comments

E-0002/002

It is too dangerous to the environment being so close to the Columbia River. Improper storage of such waste can leak and eventually contaminate this great river.

E-0003/002

Second, the danger of further contamination at Hanford where the nuclear waste can get into the water in Eastern Washington area, with who knows what effects on the people and the environment.

E-0008/001

Documented activities at Hanford have already polluted the Columbia River with radioactive materials, endangering the health of humans and wildlife.

E-0022/002

This site is leaking radioactive and other toxic carcinogens into ground water and the Columbia River, putting even more people at risk for cancer.

F-0004/001

Most certainly, this EIS, given the large amounts of proposed waste and the known and proposed storage methods are not adequate to maintain the health of the Columbia River.

F-0012/002

We have now a growing plume of radioactive groundwater extremely carcinogenic reaching out to meet the Columbia River.

F-0026/003, F-0028/003

Waste that we have created must be disposed of but it must be done with careful planning so as not to contaminate the ground and rivers of our beautiful country.

F-0029/006

Waste is leaking into the soil and water which is lethal/carcinogenic/sickening to all beings.

L-0021/001, TSE-0015/001

But, the Hanford nuclear reservation is the most contaminated site in the western world. For 60 years, in the name of progress and national security, millions of cubic meters of radioactive materials have accumulated at Hanford, and 440 billion gallons of liquid waste were dumped into the soil. Toxic chemicals inch towards the mighty Columbia River - which could become a highway to distribute plutonium, uranium, and other hazardous chemicals throughout the Columbia Basin.

L-0024/001

Please - no more hazardous waste near our Columbia River.

L-0029/003

Poisons are many and have already entered the groundwater and the Columbia River upstream from large cities (populations) whose size we can only guess 10,000 years from now will be.

L-0041/049

DOE should present an analysis of variation of risks over time from the contaminants proposed for burial at the Hanford site. A temporal analysis is necessary to gauge the effects of the burial for the foreseeable future. Radioactive waste will decay over the next million years, however many of the inorganic contaminants will never diminish in toxicity. Thus, these sites will always present a base level of human health and ecological risk that will preclude any future use. This analysis is required to assess the affect of proposed actions and is necessary to plan appropriate mitigation strategies.

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L-0043/004

Short of the best containment within our know-how today, we face certain destruction of a magnificent river system of inestimable commercial and recreational value, and greatly increased cancer deaths.

L-0043/005

Because of the tidal influence, the Willamette River will also be compromised.

E-0049/004, L-0048/004

Further, the revised EIS proposes to re-contaminate the groundwater as new burial sites are developed and the disposed waste begins to leach contaminants into the groundwater. The risks associated with recontamination resulting from future disposal of large amounts of radioactive and chemical contaminants have not been adequately analyzed.

L-0057/005

We don't need further soil and ground water contamination.

L-0060/002

The report has not made use of the "Columbia River Basin Treaty" that covers the water in the River. Testing the water using the records before the Project was started and the changes that have resulted since. We do not seem to have used these records. Enclosed is a copy of the Treaty[.]

P-0008/002

ENOUGH GROUNDWATER CONTAMINATION!

P-0021/002

It just seems crazy, especially with leakage already headed for the Columbia River. Let us keep in mind that 100's and 1000s of years is a long time to plan for.

P-0028/002

The Columbia River needs protection, not more pollution.

P-0030/003

Groundwater seeping into our River is potential health hazard for thousands.

P-0033/003

We must save the Columbia River and the future of Hanford Reach.

P-0036/001

Dumping more radioactive waste at Hanford increases more risk to human health from contaminated groundwater.

P-0047/002

The health of our people and our environment is already being very adversely affected by waste leakage.

P-0054/002

What sense comes from seeping contaminants into purity?

P-0055/002

I fear for the safety and viability of the Columbia River.

P-0058/001

With fish and other living (people, crops, etc) things depending upon the Columbia river water - it would seem to me to immediately stop any further erosion of the protection of the radio-active waste from polluting the Columbia. Already it is proved it is leaking into the Columbia[.]

Columbia River

P-0075/003

Save the Columbia River and the future of the Hanford Reach.

Protect the public health!

P-0084/001

Please do not allow contaminated groundwater to enter the Columbia River.

P-0092/003

Dumping more waste increases risk to health from contaminated groundwater.

P-0093/002

[I am very concerned about DOE's current plan regarding] groundwater / Columbia River contamination health risks[.]

P-0109/003

Please save the Columbia River & the future of the Hanford Reach!!

P-0110/001

We must stop the Hanford mess to save the Columbia River for future generations.

P-0113/001

I remain concerned that contaminants are expected to continue to leach into the Columbia River.

P-0114/002

The inevitable contamination of the Columbia River is in our future.

P-0135/002

The Columbia River is threatened by radioactive waste[.]

P-0139/001

How can Hanford, an already overloaded site, be the receiver of more [radioactive waste]. The Columbia River will be the Ultimate Receiver[.]

P-0141/001

I believe the issue of importation of solid waste to Hanford is one which is critical in light of the contamination already being experienced in the Columbia River. I believe that action to prevent such imports is vital to the safety of the region.

P-0164/001

As a downriver person worried about radioactive waste at Hanford I want to say "No" to bringing more dangerous wastes to your facility.

THR-0003/004

And also irrigation downstream. The shrub-steppe area is very dependent on agriculture economically, and the irrigation is key to allowing this agriculture to exist in areas around the Hanford Area.

THR-0008/002

The groundwater contamination doesn't consider that there is the potential, the eventuality that this is going to get into the river. That isn't even part of the assessment.

THR-0017/001

I am concerned that they [children] are going to be inheriting a world where, you know, if it goes to the river, it's going to the ocean as well. And we are killing the world.

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TLG-0003/003

There's groundwater contamination, there's contamination in the Columbia River.

TLG-0009/002

Oregonians don't want to add to the waste that is already leaking into the Columbia[.]

TPO-0011/009

But the fact that the groundwater, there is no real assessment of what's going to happen to groundwater.

TPO-0014/004

And it's clear for everyone to see that none of these steps are adequate to prevent a serious, horrible permanent disaster and the destruction of a water system and the ecosystem.

TSE-0003/001, TSE-0004/001, TSE-0005/001, TSE-0006/001, TSE-0007/001

The scenario we heard just makes me afraid that what I have always suspected, namely, that we are not going to be able to keep this stuff from getting into the groundwater.

TSE-0003/005, TSE-0004/005, TSE-0005/005, TSE-0006/005, TSE-0007/005

Clean up the waste, it's later than you think, clean up the waste, before it's in the drink.

Response

The HSW EIS evaluates impacts to the Columbia River and downstream populations for about 10,000 years. For all alternatives analyzed in this HSW EIS, DOE has analyzed the long-term movement of contaminants through soil and groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be virtually indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark drinking water standards at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Volume I Sections 5.3 and Volume II Appendix G. See also Volume I Section 5.11 and 5.14 and Volume II Appendixes F and L.

Comments

F-0021/001

It is absolutely NOT ACCEPTABLE to endanger the future Columbia River. This means no contaminated groundwater can ever enter the river. To achieve this goal the already contaminated groundwater must be cleaned and no more waste must enter the groundwater - ever; all the waste must be cleaned.

L-0012/010

We want to be assured of a defensible groundwater strategy that will protect the Columbia River.

L-0041/002

Past activities at Hanford have already resulted in significant contamination of the groundwater and vadose zone. The effects on the Columbia River from this contamination have not been fully determined. Further disposal of wastes at Hanford must not exacerbate the situation and cause increased contamination of the river

L-0041/041

The contaminant fate and transport model should be revised to include transport into and impacts on the Columbia River environment. Assessment of the interaction of the river and groundwater will require significant characterization to verify the assumptions employed in analyses to date. Upwelling of contaminated groundwater into the river requires additional clarification studies by DOE to assess potential impacts to the river environment.

P-0009/001

I agree with citizens groups believing a commitment was made by the EPA and USDOE to clean up all soil

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and groundwater to allow true unrestricted public access to the Hanford Reach by 2018. The recent strategy released by the Tri-Parties does not call for cleaning up groundwater so that this contamination will continue to enter the Columbia River.

My family and friends want you to commit!! to groundwater cleanup - for our/your children's sake and future - FUTURE!!

P-0040/001

Dumping more radioactive waste at Hanford increases risk to human health (and ecological health) from contaminated groundwater... The most recent plan (I was informed) for groundwater clean-up allows contamination to enter the Columbia River for the next 150 years.

P-0070/002

We should concentrate on preventing the contaminated water from reaching the river.

TSE-0011/004

And I think that it has become perfectly clear that the citizens of this area feel very strongly about the groundwater. It's been talked about for a number of years. And there seems to be a continued failure on the part of the Department of Energy to address the groundwater.

TSE-0027/006

I simply don't believe the charts and the numbers. The DEIS contains a lot of material, but for instance, very real problems like drinking whatever water in the Tri-Cities is just sort of glossed over. I saw no mention of systems to filter the water adequately.

TSP-0006/005

So far the waste in Hanford has traveled to the Columbia River. We know that. We know that at the present time, the facilities are not in place to monitor that or to keep the various wastes from going through the groundwater to the river. The effects of this for thousands, maybe millions of years are not known, and are absolutely a danger.

TSP-0012/001

And I wonder, my question is, how many other people that are living downstream of the Columbia River are actually drinking the water and getting contaminated with all of this horrible stuff that's underneath the ground? And there is nothing being done for it. And it doesn't seem like there is going to be anything done for it, because the cleanup process is virtually impossible, or difficult, or costly or whatever the word is.

Response

The HSW EIS evaluates impacts to the Columbia River and downstream populations for about 10,000 years. For all alternatives analyzed in this HSW EIS, DOE has analyzed the long-term movement of contaminants through soil and groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be virtually indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark drinking water standards at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Volume I Sections 5.3 and Volume II Appendix G. See also Volume I Section 5.11 and 5.14 and Volume II Appendixes F and L.

Groundwater monitoring is conducted according to TPA requirements, the Hanford Dangerous Waste Management permit, and DOE Orders. Groundwater monitoring will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations.

Groundwater contamination beneath the Hanford Site is being studied and remediated by the ongoing CERCLA program in accordance with the Tri-Party Agreement. The CERCLA process considers legally applicable Federal, State, and local laws or relevant and appropriate requirements (ARARs). Any decisions

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reached by DOE on the basis of analysis in the HSW EIS would be implemented in accordance with applicable Federal, State, and local laws and regulations. See Volume II Appendix N, Section N.2.4.

Comments

L-0058/001

The safety of all life down-river from Hanford must be foremost. Those of us who did not produce this waste should not be endangered by its leaking into the Columbia River.

Response

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The human exposure scenarios described in Volume II Appendix F consider direct and indirect use of the Columbia River water and biota (e.g., swimming, consumption of fish). For those radiological and non-radiological contaminants that will reach the Columbia River bioaccumulation of contaminants and resulting impacts to non-human biota are also expected to be small. See Volume I Sections 5.5 and 5.11, and Volume II Appendix F and Appendix I.

Comments

L-0032/003, LM-0005/003, LM-0006/003, LM-0007/003, LM-0008/003, LM-0009/003, LM-0010/003, LM-0011/003, LM-0012/003, LM-0013/003, LM-0014/003, LM-0015/003, LM-0016/003

Please do not offload more waste on us in a time when our salmon populations are in desperate need of stability in the Hanford Reach. Please don't send us these lethal chemicals in a time when our state pollution and development is on the rise.

L-0044/024

Vol. II, App. F Fish consumption: Since there is public concern regarding contamination of fish in the Columbia River, it would be worthwhile to explain why consumption of Columbia River fish is not included in the exposure pathway analysis, as listed in Table F.39.

P-0020/001

I think that dumping more radioactive waste at Hanford makes the risk to people and wildlife unacceptably high. Groundwater would be at risk for the next 150 years. That means that fish in the Columbia river would also be at risk.

P-0026/003

Our beloved Columbia River is becoming dangerously soiled. Please stop this travesty.

P-0027/002

Contamination of the Columbia River needs to be stopped: people eat fish from the river!

P-0035/001

There cannot be any worse thing then polluting the very important Columbia river. It provides life for thousands of people, fish and animals in the great Pacific Northwest.

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P-0090/002

Hanford has already contaminated the Columbia River. Some of the tanks are leaking. Contamination of salmon is extremely serious - effecting those who eat them and people whose livelihood depends on them.

P-0094/002

[By adding additional waste to Hanford, DOE is] further endangering a major waterway, endangering not only our fish but our people.

P-0104/001

Additional radioactive waste is unacceptable in the Hanford area. The Columbia River has been degraded enough without this additional risk.

P-0124/002

This [dumping waste at Hanford] would increase danger to the Columbia River and adjoining areas. It would contaminate the food supply: fish and farms by causing groundwater and river water toxicity. Also, it would cause health risks for humans and animals.

THR-0009/004

The groundwater is essential to address, it's already creating contamination in the Columbia, and I don't find any contamination in the Columbia acceptable. The fish in the Reach are already changing gender, because they don't like it either, and they sense that their survival is at risk, and so they are creating more females.

TSE-0003/007, TSE-0004/007, TSE-0005/007, TSE-0006/007, TSE-0007/007

Uphold the Tri-Party Agreement, Protect the Columbia fish, We don't want radioactive salmon, to be served up to us on our dish.

TSP-0007/003

The river. I have been told that the prediction has been that the contamination coming from Hanford into the river, by now it would be going down, and I was told, surprise, surprise, the contamination into the river is going up.

TSP-0007/005

And I think the revised, and I hope there is another revision that makes more sense this time, EIS, does indeed look down a few years ahead relative to the contamination in the river, what would the impact be? What would the impact be on people who might, for example, make the mistake and drink out of the river, make a mistake and eat a fish that is in the river, just in case there still are some fish there.

Response

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The EPA Columbia River Basin Fish Contaminants Survey 1996-1998 (EPA 2002) was a study of organic, metal, and radionuclide concentrations in 208 fish tissue samples collected from 24 locations on the Columbia, Snake, Yakima, Clearwater, Klickitat, Deschutes, Willamette and other rivers that drain the Columbia River Basin. Locations included the Hanford Reach of the Columbia River, artificial ponds on the Hanford Site, and the upper Snake River. Cancer risks were estimated for consumption of fish that were contaminated with radionuclides. These risks were small relative to the estimated risks associated with radiation from naturally occurring background sources, to which everyone is exposed. The levels of

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radionuclides in fish tissue from the Hanford Reach of the Columbia River and the ponds on the Hanford Site were similar to levels in fish from the Snake River. These estimates of risks were not combined with the potential risks from other chemicals, such as PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. The potential cancer risks from consuming fish collected from Hanford Reach and the artificial ponds on the Hanford Site were similar to cancer risks in fish collected from the upper Snake River. EPA reported that the Yakima River and the Hanford Reach of the Columbia River tended to have higher concentrations of organic chemicals than other study sites. EPA also reported that the chemicals and or chemical classes that contributed the most to cancer risk for most of the resident fish were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. For most of the anadromous fish, the chemicals that contributed the most to cancer risk were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and arsenic. These chemicals occur in the Columbia River as a result of agricultural and industrial operations (pulp and paper plants, for example) and are very unlikely to be of Hanford origin. These chemicals would not exist in wastes proposed for future disposal at Hanford, or, if initially present, would be treated to reduce their mobility and toxicity to meet applicable standards prior to disposal.

Comments

L-0041/009

DOE's own "best case" scenarios show unacceptable future risk when analyzing effects of Hanford's current inventory of waste, not even considering the effects of disposal of additional off-site waste.

Response

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The HSW EIS uses the definition of cumulative impact as defined by the CEQ Regulations (40 CFR 1508.7): "Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Potential cumulative impacts associated with implementing the HSW EIS alternative groups are summarized in Volume I Section 5.14. Past, current, and future Hanford activities include treatment and disposal of tank waste, CERCLA remediation projects, previously disposed of waste, decontamination and decommissioning of the Hanford production reactors and other facilities, waste in the PUREX tunnels, operation of a commercial LLW disposal facility by U.S. Ecology, and operation of the Columbia Generating Station by Energy Northwest. Cumulative impacts of storage, treatment, and disposal activities for a range of waste volumes are evaluated and expanded in the final HSW EIS. For most resource and potential impact areas, the combined effects from the alternative groups for the Hanford Only, Lower Bound and Upper Bound waste volumes, or for the No Action Alternative for the Hanford Only and Lower Bound waste volumes, when added to the impacts of these other activities, are small.

Several mitigation measures have been built into the alternatives addressed in the final HSW EIS, including installation of barriers, liners, and leachate collection systems in disposal facilities; treatment of MLLW to meet applicable RCRA and state requirements; and in-trench grouting or use of HICs for Cat 3 LLW and MLLW. Revised analyses in the final HSW EIS indicate that such measures would reduce the estimated releases and levels of groundwater contamination. As set forth in Volume I Section 5.3, for the action

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alternatives, constituent concentrations in groundwater at 1 km from the disposal facilities are expected to be below the benchmark drinking water standards. Water quality in the Columbia River would be virtually indistinguishable from the current background levels.

Comments

E-0048/003

Soil and groundwater contamination will increase, not decrease, under the proposed plan of importing more toxic waste to Hanford. The EIS proposes to test water at the Columbia River. However, the groundwater will certainly be poisoned at Hanford sooner than all the way at the River. This means a) Hanford will have contaminated soil and groundwater, making it unusable by people and animals, and b) by the time the toxins are measurable at the Columbia River, it will be too late to stop the river from being poisoned.

Response

The HSW EIS evaluates impacts to the Columbia River and downstream populations for about 10,000 years. For all alternatives analyzed in this HSW EIS, DOE has analyzed the long-term movement of contaminants through soil and groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be virtually indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark drinking water standards at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Volume I Sections 5.3 and Volume II Appendix G. See also Volume I Section 5.11 and 5.14 and Volume II Appendixes F and L.

Several mitigation measures have been built into the alternatives addressed in the final HSW EIS, including installation of barriers, liners, and leachate collection systems in disposal facilities; treatment of MLLW to meet applicable RCRA and state requirements; and in-trench grouting or use of HICs for Cat 3 LLW and MLLW. Revised analyses in the final HSW EIS indicate that such measures would reduce the estimated releases and levels of groundwater contamination. As set forth in Volume I Section 5.3, for the action alternatives, constituent concentrations in groundwater at 1 km from the disposal facilities are expected to be below the benchmark drinking water standards. Water quality in the Columbia River would be virtually indistinguishable from the current background levels.

Comments

TPO-0014/006

But this waste in this kind of concentration, this kind of morbidity, is going to spread in the food, in the water, it's going to blow all over of the country, it's going to blow all over the world.

Response

The HSW EIS evaluates impacts to the Columbia River and downstream populations for about 10,000 years. For all alternatives analyzed in this HSW EIS, DOE has analyzed the long-term movement of contaminants through soil and groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be virtually indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark drinking water standards at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Volume I Sections 5.3 and Volume II Appendix G. See also Volume I Section 5.11 and 5.14 and Volume II Appendixes F and L.

During facility construction and disposal operations, DOE would use appropriate measures to prevent fugitive air emissions. Once the disposal facilities are filled DOE would place caps over those facilities to prevent spread of contamination.

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Comments

E-0043/046, EM-0217/046, EM-0218/046, L-0056/046, LM-0017/046, LM-0018/046

The revised draft Hanford Solid Waste EIS (HSW EIS) adds insult to injury. The fish in the Hanford Reach are already the most chemically-contaminated in the entire Columbia River system. The fish are so poisonous that the EPA reports that tribal peoples suffer a cancer risk of 1 in 50 simply from consuming these fish. Tribal children eating fish from the Hanford Reach have risks of immune-diseases and central nervous system disorders that are over 100 times greater than for non-Indian children, according to the EPA.

L-0021/004, TSE-0015/004

However, based on past performance, we are skeptical about their [DOE's] ability to protect our precious water and fish resources.

L-0054/005

Recent studies have proven the linkage between the health of the Columbia River and its resources, Tribal human health and restoration of Tribal trust resources. In 2000 and 2001, the United States Geological Survey (USGS) released results of fish studies investigating the potential of hexavalent chromium emanating from Hanford to adversely affect Chinook salmon. USGS scientists found physiological impacts and behavioral modifications.

A study completed in September 2001 by the U.S. Centers for Disease Control concluded that Tribal members were exposed to more cancer-causing ionizing radiation from Hanford radiological discharges than other people living near Hanford. This study concluded that the Hanford Environmental Dose Reconstruction Project (HEDR) has underestimated risks from Hanford radiation by at least fifteen times, and estimated an approximate 1:50 fatal cancer risk from historic Hanford operations to Tribal people.

The U.S. Environmental Protection Agency (EPA) released the results of their "Columbia River Basin Fish Contaminant Survey" in August 2002, and found that the highest concentration of chemical contaminants in Columbia River fish were found in fish from the Hanford Reach. These organic toxins alone, without considering the contribution of radionuclides in the river, were found to pose a fatal cancer risk of up to 1 in 50 for tribal people.

The results of these studies indicate the need to reassess whether Hanford is an appropriate site to dispose of any long-lived nuclear waste, such as iodine-129, technetium-99, or any other long-lived fission products or transuranic elements.

L-0054/007

Significantly, the Hanford Site Environmental Report for Calendar Year 2001 (HSER 2001), which compiles information on risks from Hanford nuclear waste discharges, does not document the impacts found in the reports cited above. In fact, the HSER 2001 finds that Hanford's historical and current operations pose no significant impacts to humans or natural resources. This finding by USDOE is stark evidence that SWEIS analysis and planning should be conducted by an agency or contractor fully independent from Hanford, to reveal impacts of USDOE's proposed actions and to provide affected governments and affected people with transparent and credible information.

THR-0003/001

My first [concern regarding the EIS] is the salmon populations that use the Hanford Reach in that area. Now, we all know salmon migrate out to the ocean. Are they, is that species of salmon contaminated and does that contamination reach the ocean? Is it effecting the ecology in the ocean?

Response

The EPA Columbia River Basin Fish Contaminants Survey 1996-1998 (EPA 2002) was a study of organic, metal, and radionuclide concentrations in 208 fish tissue samples collected from 24 locations on the

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Columbia, Snake, Yakima, Clearwater, Klickitat, Deschutes, Willamette and other rivers that drain the Columbia River Basin. Locations included the Hanford Reach of the Columbia River, artificial ponds on the Hanford Site, and the upper Snake River. Cancer risks were estimated for consumption of fish that were contaminated with radionuclides. These risks were small relative to the estimated risks associated with radiation from naturally occurring background sources, to which everyone is exposed. The levels of radionuclides in fish tissue from the Hanford Reach of the Columbia River and the ponds on the Hanford Site were similar to levels in fish from the Snake River. These estimates of risks were not combined with the potential risks from other chemicals, such as PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. The potential cancer risks from consuming fish collected from Hanford Reach and the artificial ponds on the Hanford Site were similar to cancer risks in fish collected from the upper Snake River. EPA reported that the Yakima River and the Hanford Reach of the Columbia River tended to have higher concentrations of organic chemicals than other study sites. EPA also reported that the chemicals and or chemical classes that contributed the most to cancer risk for most of the resident fish were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and a limited number of pesticides. For most of the anadromous fish, the chemicals that contributed the most to cancer risk were PCBs (Aroclors and dioxin-like PCBs), chlorinated dioxins and furans, and arsenic. These chemicals occur in the Columbia River as a result of agricultural and industrial operations (pulp and paper plants, for example) and are very unlikely to be of Hanford origin. These chemicals would not exist in wastes proposed for future disposal at Hanford, or, if initially present, would be treated to reduce their mobility and toxicity to meet applicable standards prior to disposal.