Appendix A part 4

APPENDIX B: PUBLIC MEETING TRANSCRIPT

U.S. ENVIRONMENTAL PROTECTION AGENCY

PUBLIC MEETING

Held in the fellowship hall of

First Baptist Church

Plymouth, North Carolina

Thursday, August 16, 2007

7:00 P.M.

Volume 1 of 1

Pages 1 through 48

A P P E A R A N C E S

For the U.S. Environmental Protection Agency:

Randy Bryant, Remedial Project Manager
Angela Miller, Community Involvement Coordinator
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960
(404)562-8561

P R O C E E D I N G S 7:06 P.M.

RANDY BRYANT: The purpose of the meeting tonight is to talk about our proposed plan to deal with dioxin in sediment that is in a certain stretch of the Welch Creek, which flows through the Domtar Mill property.

As Angela said, we'll have a presentation and we'll take questions and we'll try our best to answer those questions. And if we can't answer them tonight, then if you'll leave us a mailing address or a phone number or something, we can get back with you.

What we'll do first, we'll go through a little background and history. We'll talk about a summary of the site studies, a summary of the different alternatives we considered, one that we call our preferred alternative, and then we'll talk about the time line in the coming months and year or so, and then we'll get into the question period.

And just very briefly, I'm Randy Bryant. I work for the U.S. EPA. I'm the project manager dealing with Superfund projects, you know, on the Domtar/Weyerhaeuser facility. I worked for EPA for about sixteen years. We're in our regional office out of Atlanta, Georgia, but I was born and raised in North Carolina, and I graduated from N.C. State University. But enough about me.

Superfund, what is it? It's a federal law that deals with the release of hazardous substances into the environment. The purpose of the program is to reduce risks to either people or the environment. Under the Superfund program, companies that are owned or operated at the site are required to do the necessary studies and cleanups, and EPA provides oversight throughout the process.

When you do these site specific studies, you're trying to answer four basic questions: What are the contaminants? Where are they? Is there an unacceptable risk? What are you going to do about it? And then based on those studies, EPA issues a proposed plan and seeks public comments. And we do that through the thirty-day comment period, as well as the public meeting tonight.

EPA will consider those comments and

then make a final decision, which is documented in a record of decision. And then once the record of decision has been signed, then you move on to doing the design and the actual construction of the remedy.

And just briefly a little bit about the site history. Some of you may be pretty familiar with it, but, again, the site is about one and a half miles west of Plymouth. It's a paper mill that has been in operation since 1937. They focus on fine paper, but they've also made fluff pulp, also. It was owned by Weyerhaeuser from 1957 until 2007. There's a new owner, Domtar Corporation. That's a result of a merger of certain Weyerhaeuser assets plus certain Domtar assets to form a third company, which is the one that is now managing the Plymouth mill.

Some of you probably received a fact sheet in the mail, or you may have picked up a copy from the table as we came in. There is a figure on page four in there. The figure there just gives a better idea of the location of Welch Creek and the area that we're particularly interested in.

When we were doing our study in Welch Creek, we were looking at an area that began roughly at Highway 64 and ran down to the Roanoke River. The area that we're particularly interested in, as you see on the figure, again page four of your proposed plan, you'll see a graying across that area, and you'll see some designations or markers like MT-3 down to MT-6. That's what we call the upstream or upper reach of Welch Creek. And that's an area where we have higher concentrations of dioxin in the sediment. And that's the stretch that we're really focusing on in our preferred alternative.

Through the Superfund program, we worked on several projects at the site. There was a former landfill at the site that has been capped and closed. There was the old chlorine plant that has been cleaned out. And we're also working here on Welch Creek.

Welch Creek, as you probably know -- some of you may have been on it or seen it driving on 64. It's considered a blackwater stream, a slow moving stream. There's some swamp present along some of the beddings as you move down towards the river. Wastewater was discharged from the mill at two locations in Welch Creek in a period from roughly 1957 to 1988. And, you know, the discharging was permitted going back as far as, like, 1969.

One of the four basic questions: What is it; what are we so concerned about? The main contaminant we're concerned about is dioxin. We do have detections of mercury in some of the sediment, but dioxin is what we're focusing on.

That defines the largest extent of the area that we're concerned about. Dioxin is present in sediment in certain stretches of the creek and some of the adjacent wetland soils.

Dioxin levels range anywhere from .02 to 6 parts per billion. And, again, the area of highest concentration is what we call at upstream reach, which is about a mile creek bed from the transect that's called MT-3 to MT-6 on the figure.

Another thing we have to answer is, is there unacceptable risks? So we do what's called a risk assessment. We look at potential risks to people or potential risks to the environment, as well.

Exposure to sediment or soil does not pose an unacceptable risk to people. You know, we considered people visiting, tourists coming in, coming up the creek and walking through the wetland areas. We also considered an adult recreational fisherman consuming some of his fish from the creek.

But, on the other hand, another way to try to gauge with is the fact that the State of North Carolina has -- still has a fish consumption advisory in place for certain fish in this area, particularly the catfish and carp. And, more specifically, the consumption advisory just says that women and children shouldn't eat catfish and carp, and that other folks should eat, like, one meal per month of either catfish or carp, you know, from the creek or the river.

It's also worth pointing out that across all of North Carolina, unfortunately, there's a fish consumption advisory for mercury, and that has to do with air deposition from a variety of sources across the state.

Another avenue that we looked at for potential risks was potential risks to fish, mammals, birds, and other ecological receptors. The dioxin, it can bioaccumulate up the food chain. The small, little things at the bottom of the creek come in contact with the dioxin in sediment, ingest it, and then bigger things eat them, and so on and so on up the food chain.

Given that kind of scenario, we looked at what would be an appropriate cleanup level to make sure that we protect the different ecological receptors. And based on our studies and the risk assessment, we arrived at a cleanup goal for dioxin in sediment of one part per billion. So, again, that upstream reach, that one-mile stretch, is the area where we have dioxin that's above our cleanup goal.

We do these different studies, trying to do our calculations to figure out potential risks, but we also have to consider some other things. And, on the other hand, there are improvements in the Welch Creek and river area.

The dioxin in wood duck eggs has declined almost fivefold since the mid 1990's, at least based on studies by the U.S. Fish and Wildlife Service. And also they were checking for mercury in duck eggs, and they -- the levels are very low, much lower than what would be expected to cause any problems.

And another thing to keep in mind, too, is that dioxin concentrations in fish have been declining since the mid 1990's. That's probably due in large part to the fact that around 1992 the mill changed its paper bleaching operation, which resulted in less dioxin being generated in the first place. And, as a result, you're seeing a decline in dioxin concentrations in fish, which is similar to the other declines we've seen. We're scoping down by a factor probably of five or more over the last ten to fifteen years.

So we talked a little bit about what is it, where is it, is there unacceptable risks. And then, finally, you know, what is it that you can do about it? After we -- after you do the R.I. and risk assessment, you do something called a feasibility study, which looks at a range of alternatives to deal with the issues. And you look at everything from doing no action, and in this case, from no action all the way up to dredging. In the FS, which is summarized in the proposed plan and which is also available in its entirety, if you want to look at it, at the local library here in Plymouth.

If you want to see the documents at the library, just ask for the administrative record for Welch Creek that's prepared by the U.S. EPA. And then they will have the major documents that have been generated from the site, if you want to see them for yourself.

But in the FS, you can consider no action, monitored natural recovery, variations on capping and dredging for the upstream reach, and we looked at those plus channel rerouting for the midstream reach.

Now, midstream reach is the area where the dioxin is actually below our cleanup number. The only problem is that there's a potential that you might have a little bit of stream bed erosion in that area and that that might contribute to having more exceedances of surface water standards. So we at least wanted to have some monitoring in place as part of our alternative for that midstream reach.

When they did the feasibility study, they did pilot testing, which is small scale tests. We looked at the many tests for mechanical dredging and associated dewatering that you would have to do. We also did some testing of different capping materials, being a thin-layer cap or a thicker deposit cap that was made with a base layer of wood chips followed by a thicker layer of sand.

So, when you look at your proposed plan fact sheet, you'll see the ten different alternatives. The fact that we ended up with ten just has to do with the fact that we're looking at combinations of alternatives between the two reaches. If you just simply had focused on the upstream region alone, we could have had maybe four or five.

When we're evaluating these alternatives, there are certain criteria that we use to judge them. There are nine criteria that have been set up in the Superfund regulations. The first two are called threshold criteria, which are the criteria that any remedy has to meet if it's going to be selected. And those are overall protection of human health and the environment and compliance with ARARs. The ARARs are just other laws and regulations that might apply to the situation. Balancing criteria are tradeoffs that we have used to consider the differences between the alternatives. The balancing criteria include long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost.

And, finally, we have modifying criteria, which are state acceptance and community acceptance. And that's based on the comments that we get during the comment period.

As I had mentioned, in your fact sheet it goes into a little bit more detail about the different alternatives. And, again, I had mentioned that you have the more detailed documents themselves, even greater detail, that are present in the library.

What I wanted to do was just touch on some of the basic differences between the approaches that we considered. One is simply no action. And that's something that we're required to consider for any site, and that just serves as a baseline to compare the other alternatives to.

Monitoring natural recovery is simply monitoring to show that over time you'll have enough natural sedimentation to blanket the area that you're concerned with. One of the things we have to think about, though, with monitoring natural recovery in Welch Creek is that there's not a lot of sediment load in the creek. And they have done some modeling to try to estimate how long it would take for natural sedimentation to cap or cover these contaminated sediments. And based on those preliminary modeling results, it's looking like about a hundred years for natural sedimentation to achieve the same thing that we want to do. In some cases, you know, a hundred years has been considered reasonable. But, to me, I'm just not so sure a hundred years is appropriate. I didn't really feel comfortable saying, "Well, okay, we'll just go with the monitoring natural recovery."

We also looked at dredging. The problem -- I mean, dredging can be done. The problem with dredging, though, is that it's not going to be a complete surgical procedure where you can exactly take out everything and have nothing left behind. You're going to end up -- when you dredge, you're going to end up with a residual layer of contaminants. And the end result is going to be similar potential risks to your receptors. So even though you have a thin layer instead of a thicker layer, you're still going to need to drop some kind of a cap over that. So dredging doesn't get the risk reduction that we're expected to get.

We're also going to have issues, at least potential issues, with impacts to service water quality, because once you start trying to actively dredge or remove the material, you're going to be stirring it up in the water column, and it's going to take a while for it to settle down. And the longer it stays mixed up in the surface water, it also has more potential to move further downstream.

And I had mentioned another type of cap that was considered in evaluating the pilot tests. It was a thicker cap. It was an engineered cap that had six inches of what we call hog fuel, followed by six inches of sand. And hog fuel, I had already mentioned, is just a -- it's basically bark or wood chips that's plentiful, you know, at the paper mill, so there's a ready source for that. And it serves as a good bedding layer on those contaminated sediments at the bottom.

The material that's present on the bottom of the creek is not just, like, hard packed sand or something, it's -- it's more -- it's described anywhere from gelatinous to soupy. So it's like a thin mud. And if you try to drop something on that, you have to be careful. And that was the one good thing about the hog fuel is because the different pieces kind of floating down, they tended to provide a support layer for the sand that you could drop on later.

One other thing that we considered for the midstream reach was actually trying to reroute the channel. We would just dig another stream bed adjacent to the old one and then reroute the flow. We considered that, like I say, for the midstream reach. I'm not sure -- that's really not a very good alternative. You're going to have impacts to a lot of wetlands over there, and you've got kind of limited space to actually effectively perform that.

The cost of these alternatives range anywhere from zero, as you might expect, for no action, up to approaching 27 billion for the most extension dredging option.

Our preferred alternative, which was identified in the proposal plan and we'll talk about here is what we're calling enhanced monitored natural recovery. It's essentially a thin-layer cap that would be applied to the sediments in the upstream reach. And we would also do mobility monitoring for the midstream reach, again with the idea just making sure -- or confirming whether or not you're going to have much of a problem with erosion of any of those creek sediments in that midstream reach.

With enhanced monitored natural recovery, what you're trying to do is getting a jumpstart on the natural sedimentation process. It would be a two- to four-inch layer of sand that would be deposited on the wastewater solids. As part of the program, we would have to have long-term monitoring and maintenance for the capped area. We would have long-term monitoring of biota or the fish, the little bugs that are living down at the bottom of the creek. It would also mean checking on surface water and sediment so that we could document the performance of the remedy. And the fish advisories that are in place now will remain in place until the State's standards have been met.

The cost for the preferred alternative is roughly 9.6 million. Now, that includes long-term monitoring and maintenance costs. It includes, like, thirty years of future costs just for doing the monitoring and maintenance, as well.

With this approach, there are several benefits to it. One is that we're not making the situation worse by trying to aggressively dredge the contaminated sediments and stirring them up more. And then, also, like I say, even if you dredge, you're probably going to have to come back and drop a thin-layer cap over it, anyway. And, also, too, with any of these remedies with any of our sites, you know, if you're committed to doing long-term monitoring, then that allows you to check on the performance of the remedy.

And we have something that we call five-year review that's done at our sites, particularly when we have something like a containment or a capping readily in place. You have five-year reviews where you can come back and check to make sure that it's still protected.

And the idea is that it will be able to -- this won't be the only shot at it. You know, we'll implement the thin-layer cap, monitor it and make sure it does what it needs to do. If it doesn't, we can always go back and modify it.

Just to give you an idea of what would happen from this point forward, just to kind of emphasize a few points, you know, we're in the public comment period now that's going to run through September 4th.

As Angela had mentioned, if you're going to send in written comments, they just need to be postmarked by September 4th. There are mailing addresses and phone numbers and e-mails on the handouts that you picked up as you came in through the door there.

Okay, so the comment period ends, EPA is going to review all those comments, and then we'll also prepare a response to those comments, and then we'll make a final decision about whether or not to proceed with this preferred alternative.

If we decide to proceed with the preferred alternative, then we just document it in something called the record of decision. And it's possible that we could get that signed by September or October of this year. And then after that, the latter part of 2007 and then going into 2008, EPA would negotiate a legal document with Domtar that would commit them to actually doing the construction part of the remedy. And then once that legal document has been signed by both parties, then you go into a design phase.

So, just rough estimated dates, you're looking at 2008-2009 for the design phase and then roughly 2009-2010 to get the construction done. And then after that, you're just going to have the long-term monitoring and the five-year reviews.

That's it. That's the summary of what I have for tonight. We're going on into the question and answer period.

What might be helpful is if -- I'll just move the microphone over here a little bit more towards the center. If you don't mind, if you have a question or comment, if you could just speak into the microphone. That way it makes it easier for the court reporter to more accurately capture your comments.

So, with that, if someone has a question or comment, I'll see if I can answer it.

TERRY PRATT: If you did decide to dredge in alternative ten, what would be the disposal of that dredge material; where would you put it? Would you incinerate it; would you landfill it? And if you landfill it, where would you landfill it?

RANDY BRYANT: At this point, I would think the landfill. We would separate the solid part from the liquid part. You're going to have a lot of water that you're sucking up, so you would have to have a treatment plan to take care of the liquid part. And the solid would have to be disposed of. It's possible that there's landfill capacity on the plant site itself or you would have to find another suitable facility.

TERRY PRATT: I'm sorry. My name is Terry Pratt, P-R-A-T-T. I'm president of the Albemarle Fisherman's Association and the past president of Roanoke-Chowan Wildlife Club, both of which are situated in this area. And I've been a commercial fisherman for fifty years down here, so this creek does concern me. And if you are at in the mid reach below levels now, as I understand it, and I think I'm right, North Carolina state standards on pulp mills are thirteen parts per quadrillion or non-detect for dioxins.

RANDY BRYANT: For their discharge?

TERRY PRATT: Yeah, for their discharge. So that's a big difference.

RANDY BRYANT: Yeah, but we're also talking about two different things. We're talking -- the cleanup we're talking about for the actual sediment itself, there's a surface water standard from the State of North Carolina regulating their discharge.

And, as far as active plant operations and discharges, there are different programs and different staff that are focused on that. What's I'm able to deal with is the stuff that's left on the bottom of the creek from their historic discharges.

And the cleanup number is what we figured out would be protective of the critters and the small critters at the bottom, or the fish, the river otters, and then also to, like, osprey.

TERRY PRATT: Yeah. But, as you stated, I think, the dioxin levels have been dropping in samples taken from fish and wildlife over the last two or three years.

RANDY BRYANT: Well, over a longer period of time than that.

TERRY PRATT: Yeah.

RANDY BRYANT: That is certainly right. It's on a decline. And that's another reason why I'm not advocating a real aggressive dredging operation, because things are improving without us. So we don't want to make things worse when they're already on a positive trend.

TERRY PRATT: Right. Sometimes it's best to let a sleeping dog lie.

RANDY BRYANT: Well, that's part of what we're considering, yeah.

TERRY PRATT: Is there any mechanics included that would require process regulations for pulp mills to maintain process improvement? We went from chlorine bleach to oxygen bleach to ozone bleach, and a lot of them drug their feet because they didn't want to pay the price to go from oxy to ozone simply because they had to pay for the technology. Is there something going to be included in that that says, "All right, Domtar, if you're going to run fine paper, you're going to run at this level of discharge"?

RANDY BRYANT: Well, as I was trying to point out, there's different groups that --

TERRY PRATT: I understand that, but --

RANDY BRYANT: But as far as what the Superfund can require, Superfund -- this program is not set up to say your active plant has to do this; we're trying to fix an old problem.

TERRY PRATT: I understand. But if you're fixing an old problem, it makes a lot of sense to get in front of that problem.

RANDY BRYANT: Right.

TERRY PRATT: And EPA can recommend that North Carolina require certain standards, "You will do this process this way or you go the hell out of business." I mean, it's that simple.

RANDY BRYANT: Well, they are meeting their permitted discharge standards now.

TERRY PRATT: Right.

RANDY BRYANT: And they have a permit that's in effect -- I forget when it expires, but it's several years down the road. So they're meeting their standards now.

TERRY PRATT: Yeah, they are, but they're chang -- companies are changing hands quickly. And when Union Camp sold out to International Paper, the whole environmental staff went away. And the only thing International Paper looks at is the bottom line. He could care less whether my fish die or I die, as long as he turns a profit.

So, if we don't get in front of this stuff, Mr. EPA, we ain't going to live long enough to clean it all up.

RANDY BRYANT: I understand. Have we got another question or comment?

RUSSELL LEE: My name is Russell Lee, resident of Washington County, retiree from Weyerhaeuser Company. No questions, just a statement as to fact. I understand that things are improving with Mother Nature and Father Time. Personally, I'm opposed to going in and dredging. I'm in favor of minimum impact on the creek. At the present time in the last few years, there has been increased fishing in that creek. I think we need to do a minimum amount of work.

If Superfund insists on spending $9,000,000.00, my suggestion is to take these funds and separate them and give them to Washington and Martin County. Economically, we could use them a whole lot more there. Thank you for your time.

RANDY BRYANT: Thank you.

CHRIS SMITH: Chris Smith from Roper. I'm also an ex-Weyerhaeuser employee. But I kind of agree with Russell on some of that and what he said about not dredging and disturbing. I think we've got a Pandora's box here, and it's best we try to keep it covered up.

In your reports, you showed that the dioxin is declining and the wood duck egg viability has improved. But I got -- I'm wondering about some other things, though, because your -- it seems like your report showed you had a concern about otters and birds.

Is there any hard data, any analysis actually been performed on otters or birds, other than wood ducks, birds that strictly feed on fish, like cormorants, kingfishers, blue herons, that -- you know, is that a concern in those species, or is it just --

RANDY BRYANT: Well, the bird species that I know the Fish and Wildlife Service has done studies on included, yeah, the wood duck, and they've also been looking at osprey eggs on some of those studies. As far as river otters, no.

I mean, like, I -- normally in the Superfund program we don't normally go out and catch otters and either, you know, feed them contaminants or, you know, kill them and dissect them and see what's up with them. We don't typically do that. I mean, I suppose it has been done in a few places, but we don't typically do that. We try to do it more on what has been done in previous studies and lab studies and what we know just about environmental toxicology, so we can try to avoid, you know, having to capture and kill some of these higher level animals to find out for sure.

CHRIS SMITH: My other question as far as some of the remedial steps that you're proposing about, say, putting a layer of sand on the bottom of the creek, how will that work on the slopes of the creek where you've got a fairly sleep slope? How would you contain the sand there where it sticks to the slopes and doesn't slide down?

RANDY BRYANT: Well, that's one of the reasons that we're focusing on a thin-layer cap, because we observed that when we tried to do that thicker layer, where we had, like, the hog fuel and then sand on top of that, that ended up being like about a foot-thick layer, and that's when we did start seeing more side slope failures where you have a cap, you know, sliding off so you would have stuff exposed again. So, that thicker layer is really going to be an issue. That's why we're thinking more of a thin layer.

CHRIS SMITH: How do you make hog fuel sink?

RANDY BRYANT: You soak it in water. I forget the period of time. But they soaked it in water till it was pretty dense. And when they did the pilot testing, I believe it was, like, eighty to eighty-five percent of the hog fuel did sink down, and the rest of it tended to be caught down like at the booms we had at the downstream edge.

CHRIS SMITH: Okay. Thank you.

RANDY BRYANT: Sure. Do we have any other questions?

SAM STYONS: I'm not as technical. I'm a former banker here, and retired, and actually I've got a job I don't know how I got. It's interim town manager now for the Town of Plymouth, which I wasn't looking for. We are awfully concerned about the health of our citizens here as it relates to whatever happens with Weyerhaeuser/Domtar. We've been good friends of them over the years, and they've certainly been an economic stemness to our community; however, we are learning more and more about some health problems that we think may be directly, if not indirectly, related to that plant over time.

I'm not as technical as Chris, and not as knowledgeable about fish as Mr. Pratt; however, I do remember from chemistry, things had half lives, as I remember, which is how long it took them to go away naturally.

You didn't mention how long if you don't do anything before we won't have a level that's a problem of dioxin, if it has a half life. Could you address that? And being somewhat familiar with these streams and creeks and looking at this picture here where I think these guys are spraying sand --

Is that sand or chips? That's probably sand.

RANDY BRYANT: That's sand.

SAM STYONS: -- it appears that there's a tremendous sediment problem there. If I -- we're in one of the counties that's under CAMA. If I put a little bit of sand in the river, they put me in jail. And you're talking about putting a whole lot of sand in the river that looks like it's floating in the water column and it's going to come down the river. So it doesn't -- didn't look like a good plan to me.

And it may be that the best plan is to do nothing, if there is, in fact, a reasonable period of time that, based on what you know now, this is probably going to go away and you can prevent further accumulation of this problem by whatever that other group you're talking about is supposed to be monitoring. And like Russell Lee said, we would love to have the $9,000,000.00.

RANDY BRYANT: All right. There's several things that I'm going to address. I'll take one of the latter ones. With the addition of the sand, like with the pilot test, the sand tended to sink pretty quickly. You have some of the fine particles that were suspended in the water column, but you weren't seeing those impacts very far down at all from the test area. And while you might have an immediate issue with turbidity right where you applied the sand, it's not like dioxin that was stirred up would be present potentially for several weeks in the water column.

With the sand, that is a very short-term localized issue. So I'm pretty comfortable with the lack of significant impacts from applying the sand. I think it's better to have applied it than to have done nothing.

The question about half life, the dioxin and organic contaminants like that, they last a long time. We're talking about what we might expect to see with natural recovery, we're talking about with just natural sedimentation, you know, coming down off the fields into the creek and slowly covering in this area. And with natural sedimentation, we were talking about, like, a hundred years.

I'm not sure about the actual just plain old decay of dioxin. It's a persistent contaminant. So I can't really get to the idea of what the half life would be. But sedimentation, you know, would cover it. And what that would do is reduce or prevent the little critters from coming in contact with it.

But that's what we're trying to do. If we can control it at that very bottom level, then the bigger things that are feeding on the smaller organisms will take in less dioxin, and then everything above them will be taking in less.

EDDIE MCNAIR: I'm Eddie McNair, and I have a question. If I understood correctly, you said the heaviest concentration was from MT-3 to MT-6.

RANDY BRYANT: That's right.

EDDIE MCNAIR: Okay. When you did your test, how far south of 64 was the test taken?

RANDY BRYANT: They went all the way into the confluence of the river.

EDDIE MCNAIR: Okay. And of what level were they on the south side?

RANDY BRYANT: On the south side, once you get down below MT-6, you're looking at a maximum probably in the low -- we have one part -- we have greater than one part per billion above MT-6. We're looking at something like half that or lower on that lower stretch.

So you're talking, instead of one part per billion or five parts per billion in the upstream reach, in the downstream reach you're talking about, like .5 or .4 or .3, .2 or .1. So -- and that's downstream from MT-6, so you're moving further down the creek towards the river.

EDDIE MCNAIR: Okay, now, I'm going the opposite direction.

RANDY BRYANT: Okay. You're talking about going from MT-6 up to 64?

SAM STYONS: He's above 64 about a mile.

RANDY BRYANT: Above --

MS. MILLER: He's going down to 64. He's asking down to 64.

EDDIE MCNAIR: Right.

RANDY BRYANT: Down to 64 or --

EDDIE MCNAIR: Beyond --

SAM STYONS: You're talking about McNair Road, aren't you, Eddie?

EDDIE MCNAIR: Yes.

RANDY BRYANT: Much, much, much lower once you get up here. MT-3 is the extent of where we have contaminants that are high enough to be concerned about. As you go further in this direction, the direction you're asking about, upstream, at this point, as you get approaching Highway 64, you're getting down to no detects.

EDDIE MCNAIR: Okay, good. Thanks.

WADE ROGERS: Wade Rogers. What's the highest level of dioxin that you've found?

RANDY BRYANT: It's about six parts per billion.

WADE ROGERS: Six parts per billion, and you want to get this down to one part per billion?

RANDY BRYANT: Yes.

WADE ROGERS: And this is an area about a mile and a half long?

RANDY BRYANT: It's a little over a mile.

WADE ROGERS: That nobody fishes in, nobody goes in there but the birds?

RANDY BRYANT: Somebody could go up there.

WADE ROGERS: But you would have to have a very low boat to get under the bridge and all.

RANDY BRYANT: That's true. I mean, that's -- the fishing access is kind of limited on the creek when you've got at least two or three either road or railroad bridges you have to pass under to get up the creek.

WADE ROGERS: This one part per billion, is this a state level or EPA level or federal level?

RANDY BRYANT: Well, EPA is -- this is U.S. EPA, so --

WADE ROGERS: Okay. I know at the time when the guru that decided that dioxin was so poisonous to everybody, North Carolina set their dioxin level lower than the federal government did. Of course, two years later, the guru that said it was so bad for you said, "Hey, it don't hurt you all that bad." And at that time, North Carolina stayed at eleven, but they didn't have a meter that would measure it.

I'm a forty-year employee and I'm retired, and I agree with Russell Lee, leave it alone. It's -- you said it's -- didn't you say it had dropped -- been reduced by five times in the last twenty years?

RANDY BRYANT: Yeah. Now, that's over kind of a broad area that kind of encompasses the creek and the river. It's not specifically in the creek at a given location, but just, like, in this general area, you know, where ducks, either wood ducks, osprey, or whatever could come in contact with it.

WADE ROGERS: And you can soak that hog fuel all you want to, but you're going to have to put a log boom up, because you're going to have one layer of hog fuel laying on top of the creek, and it will eventually work right on out to the river.

I agree with what they said to leave it alone and, if you've got the money you want to spend, give it to Washington County and Martin County; they can use it. Thank you.

RANDY BRYANT: All right, just one thing I wanted to point out. With our preferred alternative, we're not talking about using the hog fuel. It's one of the options that we considered, but we're talking about just a thin layer of sand on -- hog fuel is one of the other alternatives.

WADE ROGERS: It will go away in time.

BRIAN ROTH: Good evening. My name is Brian Roth. I'm the mayor of Plymouth. And our community has gone through this for many years. And obviously a lot of our local citizens work at Weyerhaeuser and now Domtar, as well. And those facilities both are extremely important to our local community.

And all these issues are of concern, how it's going to be mitigated, the environment, the impacts to the environment itself, and also, as our town manager said, impacts to our citizens.

But there's another impact that I'm going to bring up that probably other people might not be thinking about. And it's not necessarily part of your preferred or any of your alternatives. But that's the negative impact that this whole process has had on our local economy over many years as far as the fishing moratoriums, public perception, not just in our community but the perception --

I want to go on record. That's why I'm up here. Our folks probably pretty much understand this.

-- the perception outside of our community. We have very large bass tournaments. Lots of different types of fishing takes place out there. A lot of different types of enjoyment of the river can and should be taking place, but we have a -- there is a stigma attached to this river, particularly the lower Roanoke River, based on what has happened.

And it is going to be very important how that's miti -- that issue is mitigated going forward, as well. I know there's an effort with EPA and NOAA and so on to work through that.

But there again, I just want to go on record that there is a very serious, strong negative impact economically and perception-wise that has taken place here in conjunction with this project.

And we do want to continue our support of Weyerhaeuser and Domtar both. They're vitally critical to the health of our economy, as well. But all that needs to be taken into consideration, not necessarily picking an alternative but this project, mediation project, in a large sense. Thank you.

RANDY BRYANT: Maybe that speaks to, "We need to just try to get on with it and make a decision and get something going to try to finish off the process," kind of what you're getting at; that would be helpful if we can just -- the faster we can get through the process and call it done?

BRIAN ROTH: Not necessarily. I just wanted you-all to take that message back, that when we get to the reparation portion of the project, which some of that has already taken place, but those discussions will continue over probably twelve months to a couple of years there --

RANDY BRYANT: Oh, I see.

BRIAN ROTH: -- and that's where these folks here are saying this $9,000,000.00 is not insignificant; we have been economically injured as a community, enjoying the river and the resources that has been denied to those folks who like to use the river.

CHRIS SMITH: Chris Smith again. I guess hitchhiking on what Mayor Roth said, the likelihood of seeing canoe platforms on Welch Creek is pretty remote, then, if somebody wanted to be canoeing down there. It's like it's going to be one of those areas that you would be encouraged not to spend a lot of time on.

RANDY BRYANT: Actually, canoeing would be fine. I mean, I understand there's a difference between, you know, what's practical and what people perceive it to be. But just from a practical perspective, canoeing would be fine. It's more of an issue with the water moccasins.

Do we have any other comments? That's fine, if you do. If we don't, then I would say, thanks for coming -- did you have a comment?

DAVID JONES: My name is David Jones. I'm retired. I was a little bit late coming in. I didn't get the whole situation about what's going on, but what's going to happen if you do nothing, and what is going to -- what good is it going to do, if you do something? And is that a grant that's paying for this?

RANDY BRYANT: All right, so that's three things. If we did nothing, then you would see what you have now. You would have the fish consumption advisories; they're going to be in place. And they're going to be in place even if we do our preferred alternative. Those advisories are going to continue for a little while, but I would expect that with the remedy put in place that they should come off faster.

As far as who's paying for it or a grant or whatnot, no, with the Superfund program, the company itself has got to pay for it. It's not federal money that would actually get the work done, Domtar would be the one that would be implementing and paying for the work under EPA oversight.

The only time the federal government does it is if, like to say, that was actually an abandoned, and nobody -- the company had gone bankrupt and there was nobody on it, then the federal government could come in and spend its money for studies and cleanups, but as it stands now, it would be Domtar.

And keeping in mind, also, these are cost estimates. I wouldn't get hung up on the exact dollar amount, but what's important is the relative difference in cost between the alternatives.

Obviously, no action is the cheapest thing, doing some more monitoring would be a little bit more expensive, doing a thin-layer cap plus monitoring would be another step in expenses, and then on up to dredging which is the most expensive one, because you've got material to move and landfill and you've got water to treat.

So, again, the costs are more just to illustrate the relative differences between them, not necessarily exact dollar amounts. And, I guess, also, too, you know, those costs include estimates for future monitoring and maintenance.

So the construction up front could be less, but it would still be a few million for the actual construction, and then you've got all that monitoring over a thirty-year period that's -- we made cost estimates for.

DAVID JONES: It will last thirty years?

RANDY BRYANT: Oh, it lasts at least that long, but we use thirty years as a standard, kind of, time frame to compare costs.

DAVID JONES: Uh-huh, and could cost up to $27,000,000.00 or anywhere between?

RANDY BRYANT: If you tried to do that dredging. If you tried to do the extensive dredging, then that's when you're getting up to that $27,000,000.00.

DAVID JONES: So, nobody is going to have a job -- I mean, are they willing to hire anybody from around here to do it, in case I need a job?

RANDY BRYANT: I'll leave that to Domtar.

RUSSELL LEE: Russell Lee. Are there any

more scheduled meetings in Martin County or anywhere concerning this jo -- this project? I don't feel there was sufficient public announcement, because I only by coincidence heard it today. I read two or three newspapers regularly, and I didn't see any announcements in the papers.

RANDY BRYANT: What we do -- oh, are you finished?

RUSSELL LEE: Yes.

RANDY BRYANT: Okay. What we did on this one, this particular project, is we sent out mailers with fact sheets to the folks we had on our mailing list. We ran an ad in the Roanoke Beacon. The Enterprise Newspaper called and talked to me the other day, and I thought they were going to do a story. And in the past, you know, we've had fact sheets and public meetings for other activities out there.

And I remember myself I sent out another fact sheet back in 2005 that just kind of ran through the different projects that were going on including this one. So, I'm hoping with the different things we've done, we've gotten the word out, and --

RUSSELL LEE: I don't think so.

RANDY BRYANT: All right.

MITCHELL PATRICK: My name is Mitchell Patrick. I'm representing Martin-Tyrell-Washington District Health Department. And from a public health standpoint, we would like to see whichever method is going to have the greatest impact on protecting the public health implemented. If this alternative three is the one, then that's what we would like to see done. I do have one question. You're talking about two to four centimeters of sand?

RANDY BRYANT: I'm sorry. Two to four inches; five to ten centimeters.

MITCHELL BRYANT: I'm sorry. Yeah, I meant two to four inches, five to ten centimeters, of sand over the bottom of this creek. And it says, while a new benthic community will colonize the clean substrate. Can you tell me roughly how long that will take?

RANDY BRYANT: It would take a matter of months to -- because in the pilot test, you know, we did smaller scale areas. You know, say roughly a hundred by a hundred where we did these kind of caps, and they would -- they had a test area where they monitored the benthos, and then they also monitored the capped areas after they were put in places and how quickly things came back.

And it tended to be a matter of months. I think maybe in some cases maybe up to a year, but it was generally fairly quick, a matter of months.

MITCHELL PATRICK: Okay, thank you.

RANDY BRYANT: Well, folks, I think we're winding down. If we are, then I would say, thanks for coming out. Remember that if you have any additional questions or comments maybe after you get home, if you think of something next week, our contact information is on the fact sheet, so you should be able to reach us. And if you have anything immediately even here after we wrap up, just come up and ask me. But, again, thanks for coming out, and I hope we've been able to answer at least most of your questions.

(The proceedings were concluded at 8:01 p.m.)

* * * END OF TRANSCRIPT * * *

NORTH CAROLINA

PITT COUNTY

C E R T I F I C A T E

I, Heather S. Van Dorp, CVR, Notary/Reporter, do hereby certify that the forty-eight pages which constitute this public hearing are a true and accurate transcript of the proceedings.

This is the 27th day of August, 2007.

____

Heather S. Van Dorp, CVR
Notary Public, #19971070102

APPENDIX C: STATE CONCURRENCE LETTER

NCDENR
North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director | **Division of Waste Management** | Michael F. Easley, Governor
William G. Ross Jr., Secretary

26 September 2007

Mr. Randy Bryant
Superfund Branch, Waste Management Division
US EPA Region IV
61 Forsyth Street, SW
Atlanta, Georgia 30303

SUBJECT: Concurrence with Record of Decision
Domtar (formerly Weyerhaeuser) Site Operable Unit #4 (Welch Creek)
Plymouth, Martin County

Dear Mr. Bryant:

The State of North Carolina, by and through its Department of Environment and Natural Resources, Division of Waste Management (hereinafter referred to as "the State"), reviewed the Record of Decision (ROD) received by the Division on 25 September 2007 for the Domtar (formerly Weyerhaeuser) Site Operable Unit #4 (Welch Creek) and concurs with the selected remedy, subject to the following conditions:

1. State concurrence on the ROD for this site is based solely on the information contained in the ROD received by the State on 25 September 2007, including the evaluation of the dredging alternatives. Should the State receive new or additional information which significantly affects the conclusions or amended remedy contained in the ROD, it may modify or withdraw this concurrence with written notice to EPA Region IV. Additionally, the State notes the comments on the draft plan by the NC Division of Marine Fisheries and the NC Wildlife Resources Commission.

2. State concurrence on this ROD in no way binds the State to concur in future decisions or commits the State to participate, financially or otherwise, in the clean up of the site. The State reserves the right to review, overview comment, and make independent assessment of all future work relating to this site.

3. If, after remediation is complete, the total residual risk level exceeds 10^{-6}, the State may require deed recordation/restriction to document the presence of residual contamination and possibly limit future use of the property as specified in NCGS 130A-310.8

The State of North Carolina appreciates the opportunity to comment on the ROD and looks forward to working with EPA on the remedy for the subject site. If you have any questions or comments, please call Mr. Nile Testerman at 919/508-8482.

Sincerely,

Dexter R. Matthews, Director
Division of Waste Management

cc: Jack Butler, Chief NC Superfund Section
David Lown, NC Superfund
Nile Testerman, NC Superfund
Fred Harris, Interim Executive Director, Wildlife Resources
Dr. Louis Daniel, Director of Marine Fisheries

Attachment 1
Ecological Risk Tables
Welch Creek
Domtar (formerly Weyerhaeuser) Site
Operable Unit 4
Plymouth, NC

Table 8-1
Ecological Lines of Evidence for the Conservative Evaluation of the Piscivorous Mammalian Endpoint (River Otter)

ENDPOINT	COPCs	HQ EVALUATION CONSERVATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Piscivorous Mammalian Species	Dioxin TEQ[1]	$HQ_{max\text{-}NOAEL}$ = 14 $HQ_{avg\text{-}NOAEL}$ = 5.1 $HQ_{max\text{-}LOAEL}$ = 1.4 $HQ_{avg\text{-}LOAEL}$ = 0.51	100% of the modeled risk is attributable to fish in the diet. The maximum concentration in fish is 2x average background concentration.	NA	Yes
	Dioxin TEQ[2]	$HQ_{max\text{-}NOAEL}$ = 14 $HQ_{avg\text{-}NOAEL}$ = 5.1 $HQ_{max\text{-}LOAEL}$ = 1.4 $HQ_{avg\text{-}LOAEL}$ = 0.51	100% of the modeled risk is attributable to fish in the diet. The maximum concentration in fish is 2x average background concentration.	NA	Yes
	Mercury	$HQ_{max\text{-}NOAEL}$ = 28 $HQ_{avg\text{-}NOAEL}$ = 7.6 $HQ_{max\text{-}LOAEL}$ = 2.6 $HQ_{avg\text{-}LOAEL}$ = 0.71	100% of the modeled risk is attributable to fish in the diet.	Observed mercury concentrations in fish from Welch Creek are consistent with local, regional and national background concentrations.	Yes
	Chromium	$HQ_{max\text{-}NOAEL}$ = 0.02 $HQ_{avg\text{-}NOAEL}$ = 0.0074 $HQ_{max\text{-}LOAEL}$ = 0.0013 $HQ_{avg\text{-}LOAEL}$ = 0.0005	Chromium is detected in fish but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO mammalian TEFs (1998)
Conservative evaluation - maximum and average concentrations and NOAEL and LOAEL based

Table 8-2
Ecological Lines of Evidence for the Conservative Evaluation of the Piscivorous Avian Endpoint (Great Blue Heron)

ENDPOINT	COPCs	HQ EVALUATION CONSERVATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Piscivorous Avian Species	Dioxin TEQ[(1)] (Unadjusted TRV)	$HQ_{max\text{-}NOAEL}$ = 0.66 $HQ_{avg\text{-}NOAEL}$ = 0.23 $HQ_{max\text{-}LOAEL}$ = 0.07 $HQ_{avg\text{-}LOAEL}$ = 0.02	Dioxin TEQ[1] is detected in fish, wetland soil and wetland water but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in all scenarios, dioxin TEQ is not retained as a final COC for this endpoint.	No
	Dioxin TEQ[(1)] (Adjusted TRV)	$HQ_{max\text{-}NOAEL}$ = 6.6 $HQ_{avg\text{-}NOAEL}$ = 2.3 $HQ_{max\text{-}LOAEL}$ = 0.66 $HQ_{avg\text{-}LOAEL}$ = 0.23	Wetland soil and fish each attribute approximately 50% of the modeled risk for this endpoint. The maximum sediment concentration is 4x greater than the average concentration. The maximum fish concentration is over 3x greater than the average concentration. Only modeled exposure using the more conservative NOAEL value resulted in a HQ greater than 1.0.	NA	Yes
	Dioxin TEQ[(2)] (Unadjusted TRV)	$HQ_{max\text{-}NOAEL}$ = 2.7 $HQ_{avg\text{-}NOAEL}$ = 0.69 $HQ_{max\text{-}LOAEL}$ = 0.27 $HQ_{avg\text{-}LOAEL}$ = 0.07	Wetland soil and fish each attribute approximately 50% of the modeled risk. The maximum sediment concentration is 4x greater than the average concentration. The maximum fish concentration is over 3x greater than the average concentration. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0.	NA	Yes
	Dioxin TEQ[(2)] (Adjusted TRV)	$HQ_{max\text{-}NOAEL}$ = 27 $HQ_{avg\text{-}NOAEL}$ = 6.9 $HQ_{max\text{-}LOAEL}$ = 2.7 $HQ_{avg\text{-}LOAEL}$ = 0.69	Wetland soil and fish each attribute approximately 50% of the modeled risk for this endpoint. The maximum sediment concentration is 4x greater than the average concentration. The maximum fish concentration is over 3x greater than the average concentration.	NA	Yes
	Mercury	$HQ_{max\text{-}NOAEL}$ = 37 $HQ_{avg\text{-}NOAEL}$ = 10 $HQ_{max\text{-}LOAEL}$ = 3.7 $HQ_{avg\text{-}LOAEL}$ = 1.0	99% of the modeled risk is attributable to fish in the diet.	Observed mercury concentrations in fish from Welch Creek are consistent with local, regional and national background concs.	Yes
	Chromium	$HQ_{max\text{-}NOAEL}$ = 0.06 $HQ_{avg\text{-}NOAEL}$ = 0.02 $HQ_{max\text{-}LOAEL}$ = 0.01 $HQ_{avg\text{-}LOAEL}$ = 0.004	Chromium is detected in wetland soil and fish but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in all scenarios, chromium is not retained as a final COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Conservative evaluation = maximum and average concentrations and NOAEL and LOAEL based
Shaded rows indicate use of the more conservative adjusted NOAEL (1×10^{-6} mg/kg-day) and LOAEL (1×10^{-5} mg/kg-day).

Table 8-3
Ecological Lines of Evidence for the Conservative Evaluation of the Insectivorous/Herbivorous Avian Endpoint (Normal Wood Duck)

ENDPOINT	COPCs	HQ EVALUATION CONSERVATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Insectivorous/ Herbivorous Avian Species (normal)	Dioxin TEQ[(1)] (Unadjusted TRV)	$HQ_{max\text{-}NOAEL}$ = 1.0 $HQ_{avg\text{-}NOAEL}$ = 0.25 $HQ_{max\text{-}LOAEL}$ = 0.10 $HQ_{avg\text{-}LOAEL}$ = 0.03	The modeled risk for this endpoint is 56% attributable to sediment and 37% attributable to plants.	Given low modeled HQs (=1.0) in all scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint.	No
	Dioxin TEQ[(1)] (Adjusted TRV)	**$HQ_{max\text{-}NOAEL}$ = 10 $HQ_{avg\text{-}NOAEL}$ = 3.0 $HQ_{max\text{-}LOAEL}$ = 1.0 $HQ_{avg\text{-}LOAEL}$ = 0.3**	**The modeled risk for this endpoint is 55% attributable to sediment and 38% attributable to plants. The use of the more conservative NOAEL and LOAEL values resulted in a HQ greater than 1.0.**	**NA**	**Yes**
	Dioxin TEQ[(2)] (Unadjusted TRV)	$HQ_{max\text{-}NOAEL}$ = 4.7 $HQ_{avg\text{-}NOAEL}$ = 1.0 $HQ_{max\text{-}LOAEL}$ = 0.47 $HQ_{avg\text{-}LOAEL}$ = 0.11	The modeled risk for this endpoint is 55% attributable to sediment and 38% attributable to plants. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0.	NA	Yes
	Dioxin TEQ[(2)] (Adjusted TRV)	**$HQ_{max\text{-}NOAEL}$ = 47 $HQ_{avg\text{-}NOAEL}$ = 11 $HQ_{max\text{-}LOAEL}$ = 5.0 $HQ_{avg\text{-}LOAEL}$ = 1.1**	**The modeled risk for this endpoint is 55% attributable to sediment and 38% attributable to plants. The use of the more conservative NOAEL and LOAEL values resulted in a HQ greater than 1.0.**	**NA**	**Yes**
	Mercury	$HQ_{max\text{-}NOAEL}$ = 4.2 $HQ_{avg\text{-}NOAEL}$ = 1.6 $HQ_{max\text{-}LOAEL}$ = 0.41 $HQ_{avg\text{-}LOAEL}$ = 0.16	The modeled risk is 80% attributable to sediment and 20% attributable to invertebrates. Only modeled exposures compared to the NOAEL resulted in a HQ greater than 1.0.	NA	Yes
	Chromium	$HQ_{max\text{-}NOAEL}$ = 0.53 $HQ_{avg\text{-}NOAEL}$ = 0.11 $HQ_{max\text{-}LOAEL}$ = 0.13 $HQ_{avg\text{-}LOAEL}$ = 0.03	Chromium is detected in sediment and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No
	Zinc	$HQ_{max\text{-}NOAEL}$ = 0.43 $HQ_{avg\text{-}NOAEL}$ = 0.24 $HQ_{max\text{-}LOAEL}$ = 0.05 $HQ_{avg\text{-}LOAEL}$ = 0.03	Zinc is detected in all media but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, zinc has not been retained as a final ecological COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Conservative evaluation - maximum and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1×10^{-6} mg/kg-day) and LOAEL (1×10^{-5} mg/kg-day).

Table 8-4
Ecological Lines of Evidence for the Conservative Evaluation of the Insectivorous/Herbivorous Avian Endpoint (Breeding Female Wood Duck)

ENDPOINT	COPCs	HQ EVALUATION CONSERVATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Insectivorous/ Herbivorous Avian Species (Breeding)	Dioxin TEQ [1] (Unadjusted TRV)	$HQ_{max-NOAEL}$ = 0.89 $HQ_{avg-NOAEL}$ = 0.24 $HQ_{max-LOAEL}$ = 0.09 $HQ_{avg-LOAEL}$ = 0.02	The modeled risk for this endpoint is 64% attributable to sediment, 21% attributable to plants, and 14% attributable to invertebrates.	Given low modeled HQs (=1.0) in all scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint.	No
	Dioxin TEQ [1] (Adjusted TRV)	**$HQ_{max-NOAEL}$ = 9.0 $HQ_{avg-NOAEL}$ = 2.4 $HQ_{max-LOAEL}$ = 0.89 $HQ_{avg-LOAEL}$ = 0.24**	**The modeled risk for this endpoint is 64% attributable to sediment, 21% attributable to plants, and 14% attributable to invertebrates. Only modeled exposure compared to the more conservative NOAEL resulted in a HQ greater than 1.0.**	**NA**	**Yes**
	Dioxin TEQ [2] (Unadjusted TRV)	$HQ_{max-NOAEL}$ = 4.1 $HQ_{avg-NOAEL}$ = 1.1 $HQ_{max-LOAEL}$ = 0.41 $HQ_{avg-LOAEL}$ = 0.11	The modeled risk for this endpoint is 63% attributable to sediment, 22% attributable to plants, and 14% attributable to invertebrates. Only modeled exposure compared to the NOAEL resulted in a HQ greater than 1.0.	NA	Yes
	Dioxin TEQ [2] (Adjusted TRV)	**$HQ_{max-NOAEL}$ = 41 $HQ_{avg-NOAEL}$ = 11 $HQ_{max-LOAEL}$ = 4.1 $HQ_{avg-LOAEL}$ = 1.1**	**The modeled risk for this endpoint is 64% attributable to sediment, 21% attributable to plants, and 14% attributable to invertebrates.**	**NA**	**Yes**
	Mercury	$HQ_{max-NOAEL}$ = 4.9 $HQ_{avg-NOAEL}$ = 2.2 $HQ_{max-LOAEL}$ = 0.49 $HQ_{avg-LOAEL}$ = 0.22	The modeled risk is 67% attributable to sediment and 33% attributable to invertebrates. Only modeled exposures compared to the NOAEL resulted in a HQ greater than 1.0.	NA	Yes
	Chromium	$HQ_{max-NOAEL}$ = 0.54 $HQ_{avg-NOAEL}$ = 0.12 $HQ_{max-LOAEL}$ = 0.14 $HQ_{avg-LOAEL}$ = 0.03	Chromium is detected in sediment and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No
	Zinc	$HQ_{max-NOAEL}$ = 0.46 $HQ_{avg-NOAEL}$ = 0.32 $HQ_{max-LOAEL}$ = 0.05 $HQ_{avg-LOAEL}$ = 0.04	Zinc is detected in all media but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, zinc has not been retained as a final COPC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Conservative evaluation - maximum and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1 x 10^{-6} mg/kg-day) and LOAEL (1 x 10^{-5} mg/kg-day).

Table 8-5
Ecological Lines of Evidence for the Conservative Evaluation of the Insectivorous Avian Endpoint (Barn Swallow)

ENDPOINT	COPCs	HQ EVALUATION CONSERVATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Insectivorous Avian Species	Dioxin TEQ [1] (Unadjusted TRV)	$HQ_{max\text{-}NOAEL} = 0.27$ $HQ_{avg\text{-}NOAEL} = 0.14$ $HQ_{max\text{-}LOAEL} = 0.03$ $HQ_{avg\text{-}LOAEL} = 0.01$	Dioxin TEQ was detected in invertebrates and surface water but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, dioxin TEQ is not retained as a final COC for this endpoint.	No
	Dioxin TEQ [1] (Adjusted TRV)	**$HQ_{max\text{-}NOAEL} = 2.7$ $HQ_{avg\text{-}NOAEL} = 1.4$ $HQ_{max\text{-}LOAEL} = 0.27$ $HQ_{avg\text{-}LOAEL} = 0.14$**	**The modeled risk for this endpoint is greater than 99% attributable to the dioxin TEQ concentration in invertebrates. Use of the more conservative NOAEL resulted in a HQ greater than 1.0.**	**NA**	**Yes**
	Dioxin TEQ [2] (Unadjusted TRV)	$HQ_{max\text{-}NOAEL} = 1.3$ $HQ_{avg\text{-}NOAEL} = 0.68$ $HQ_{max\text{-}LOAEL} = 0.13$ $HQ_{avg\text{-}LOAEL} = 0.07$	The modeled risk for this endpoint is greater than 99% attributable to the dioxin TEQ concentration in invertebrates. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0.	NA	Yes
	Dioxin TEQ [2] (Adjusted TRV)	**$HQ_{max\text{-}NOAEL} = 13.0$ $HQ_{avg\text{-}NOAEL} = 6.8$ $HQ_{max\text{-}LOAEL} = 1.3$ $HQ_{avg\text{-}LOAEL} = 0.68$**	**The modeled risk for this endpoint is greater than 99% attributable to the dioxin TEQ concentration in invertebrates. Use of the more conservative LOAEL resulted in a HQ greater than 1.0.**	**NA**	**Yes**
	Mercury	$HQ_{max\text{-}NOAEL} = 1.4$ $HQ_{avg\text{-}NOAEL} = 0.90$ $HQ_{max\text{-}LOAEL} = 0.14$ $HQ_{avg\text{-}LOAEL} = 0.09$	The modeled risk for this endpoint is greater than 99% attributable to the mercury concentration in invertebrates. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0.	Observed mercury concentrations in emergent insects from Welch Creek are consistent with background reported in the literature.	Yes
	Chromium	$HQ_{max\text{-}NOAEL} = 0.07$ $HQ_{avg\text{-}NOAEL} = 0.03$ $HQ_{max\text{-}LOAEL} = 0.02$ $HQ_{avg\text{-}LOAEL} = 0.01$	Chromium is detected in the invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, chromium is not retained as a final COC for this endpoint.	No
	Zinc	$HQ_{max\text{-}NOAEL} = 0.19$ $HQ_{avg\text{-}NOAEL} = 0.16$ $HQ_{max\text{-}LOAEL} = 0.02$ $HQ_{avg\text{-}LOAEL} = 0.02$	Zinc is detected in surface water and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, zinc is not retained as a final COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Conservative evaluation - maximum and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1 x 10[illegible] mg/kg-day) and LOAEL (1 x 10[illegible] mg/kg-day).

Table 8-6
Ecological Lines of Evidence for the Alternative Evaluation of the Piscivorous Mammalian Endpoint (River Otter)

ENDPOINT	COPCs	HQ EVALUATION ALTERNATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Piscivorous Mammalian Species	Dioxin TEQ[1]	$HQ_{95\%UCL-NOAEL}$ = 2.2 $HQ_{avg-NOAEL}$ = 1.2 $HQ_{95\%UCL-LOAEL}$ = 0.22 $HQ_{avg-LOAEL}$ = 0.12	100% of the modeled risk is attributable to fish in the diet. The maximum concentration in fish is 2x average background concentration.	NA	Yes
	Dioxin TEQ[2]	$HQ_{95\%UCL-NOAEL}$ = 2.2 $HQ_{avg-NOAEL}$ = 1.2 $HQ_{95\%UCL-LOAEL}$ = 0.22 $HQ_{avg-LOAEL}$ = 0.12	100% of the modeled risk is attributable to fish in the diet. The maximum concentration in fish is 2x average background concentration.	NA	Yes
	Mercury	$HQ_{95\%UCL-NOAEL}$ = 2.4 $HQ_{avg-NOAEL}$ = 2.3 $HQ_{95\%UCL-LOAEL}$ = 0.23 $HQ_{avg-LOAEL}$ = 0.20	100% of the modeled risk is attributable to fish in the diet. Observed mercury concentrations in fish from Welch Creek are consistent with local, regional and national background concentrations.	NA.	Yes
	Chromium	$HQ_{95\%UCL-NOAEL}$ = 0.0015 $HQ_{avg-NOAEL}$ = 0.0011 $HQ_{95\%UCL-LOAEL}$ = 0.000098 $HQ_{avg-LOAEL}$ = 0.000075	Chromium is detected in fish but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No

[1] TEQ based on I-TEFs (USEPA, 1987)
[2] TEQ based on WHO mammalian TEFs (1998)
Alternative evaluation -95%UCL and average concentrations and NOAEL and LOAEL based

Table 8-7
Ecological Lines of Evidence for the Alternative Evaluation of the Piscivorous Avian Endpoint (Great Blue Heron)

ENDPOINT	COPCs	HQ EVALUATION ALTERNATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Piscivorous Avian Species	Dioxin TEQ[1] (Unadjusted TRV)	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.25 $HQ_{avg\text{-}NOAEL}$ = 0.13 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.02 $HQ_{avg\text{-}LOAEL}$ = 0.01	Dioxin TEQ[1] is detected in fish, wetland soil and wetland water but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in all scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint.	No
	Dioxin TEQ[1] (Adjusted TRV)	**$HQ_{95\%UCL\text{-}NOAEL}$ = 2.5 $HQ_{avg\text{-}NOAEL}$ = 1.3 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.25 $HQ_{avg\text{-}LOAEL}$ = 0.13**	**64% of modeled risk is attributed to fish in the diet with 34 % of modeled risk attributed to exposure to sediment. Use of more conservative NOAEL resulted in modeled HQ greater than 1.**	**NA**	**Yes**
	Dioxin TEQ[2] (Unadjusted TRV)	$HQ_{95\%UCL\text{-}NOAEL}$ =0.53 $HQ_{avg\text{-}NOAEL}$ = 0.78 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.03 $HQ_{avg\text{-}LOAEL}$ = 0.01	Dioxin TEQ[2] is detected in fish, wetland soil and wetland water but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in the alternative scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0.	No
	Dioxin TEQ[2] (Adjusted TRV)	**$HQ_{95\%UCL\text{-}NOAEL}$ =5.3 $HQ_{avg\text{-}NOAEL}$ = 7.8 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.3 $HQ_{avg\text{-}LOAEL}$ = 0.1**	**61 % of modeled risk is attributed to fish in the diet. 32% of modeled risk due to exposure to sediment. Use of more conservative NOAEL resulted in modeled HQ greater than 1.**	**NA**	**Yes**
	Mercury	$HQ_{95\%UCL\text{-}NOAEL}$ = 7.1 $HQ_{avg\text{-}NOAEL}$ = 5.0 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.68 $HQ_{avg\text{-}LOAEL}$ = 0.49	99% of the modeled risk is attributable to fish in the diet. Observed mercury concentrations in fish from Welch Creek are consistent with local, regional and national background concentrations.	NA	Yes
	Chromium	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.02 $HQ_{avg\text{-}NOAEL}$ = 0.01 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.002 $HQ_{avg\text{-}LOAEL}$ = 0.001	Chromium is detected in wetland soil and fish but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Alternative evaluation - 95%UCL and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1×10^{-6} mg/kg-day) and LOAEL (1×10^{-5} mg/kg-day).

Table 8-8
Ecological Lines of Evidence for the Alternative Evaluation of the Insectivorous/Herbivorous Avian Endpoint (Normal Wood Duck)

ENDPOINT	COPCs	HQ EVALUATION ALTERNATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Insectivorous/ Herbivorous Avian Species (normal)	Dioxin TEQ[1] (Unadjusted TRV)	$HQ_{95\%UCL-NOAEL}$ = 0.12 $HQ_{avg-NOAEL}$ = 0.03 $HQ_{95\%UCL-LOAEL}$ = 0.012 $HQ_{avg-LOAEL}$ = 0.003	Dioxin TEQs are detected in sediment and invertebrates but do not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, dioxin TEQ is not retained as a final COC for this endpoint.	No
	Dioxin TEQ[1] (Adjusted TRV)	**$HQ_{95\%UCL-NOAEL}$ = 1.2 $HQ_{avg-NOAEL}$ = 0.3 $HQ_{95\%UCL-LOAEL}$ = 0.12 $HQ_{avg-LOAEL}$ = 0.03**	**Modeled risk predominantly attributable to exposure to sediment. Use of more conservative NOAEL resulted in modeled HQ greater than 1.0**	**NA**	**Yes**
	Dioxin TEQ[2] (Unadjusted TRV)	$HQ_{95\%UCL-NOAEL}$ = 0.73 $HQ_{avg-NOAEL}$ = 0.13 $HQ_{95\%UCL-LOAEL}$ = 0.07 $HQ_{avg-LOAEL}$ = 0.013	Dioxin TEQs are detected in sediment and invertebrates but do not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in alternative scenarios, dioxin TEQ is not retained as a final COC for this endpoint. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0.	No
	Dioxin TEQ[2] (Adjusted TRV)	**$HQ_{95\%UCL-NOAEL}$ = 7.3 $HQ_{avg-NOAEL}$ = 1.3 $HQ_{95\%UCL-LOAEL}$ = 0.7 $HQ_{avg-LOAEL}$ = 0.13**	**Modeled risk predominantly attributable to exposure to sediment. Use of more conservative NOAEL resulted in modeled HQ greater than 1.0**	**NA**	**Yes**
	Mercury	$HQ_{95\%UCL-NOAEL}$ = 0.58 $HQ_{avg-NOAEL}$ = 0.21 $HQ_{95\%UCL-LOAEL}$ = 0.06 $HQ_{avg-LOAEL}$ = 0.02	Mercury is detected in sediment and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in 6 of 8 scenarios, mercury is not retained as a final COC for this endpoint.	No
	Chromium	$HQ_{95\%UCL-NOAEL}$ = 0.08 $HQ_{avg-NOAEL}$ = 0.02 $HQ_{95\%UCL-LOAEL}$ = 0.019 $HQ_{avg-LOAEL}$ = 0.004	Chromium is detected in sediment and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, chromium is not retained as a final COC for this endpoint.	No
	Zinc	$HQ_{95\%UCL-NOAEL}$ = 0.08 $HQ_{avg-NOAEL}$ = 0.06 $HQ_{95\%UCL-LOAEL}$ = 0.01 $HQ_{avg-LOAEL}$ = 0.01	Zinc is detected in all media but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, zinc is not retained as a final COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998) Alternative evaluation - 95%UCL and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1×10^{-6} mg/kg-day) and LOAEL (1×10^{-5} mg/kg-day)

Table 8-9
Ecological Lines of Evidence for the Alternative Evaluation of the Insectivorous/Herbivorous Avian Endpoint (Breeding Wood Duck)

ENDPOINTS	COPCs	HQ EVALUATION ALTERNATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Insectivorous/ Herbivorous Avian Species (Breeding)	Dioxin TEQ[1] (Unadjusted TRV)	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.12 $HQ_{avg\text{-}NOAEL}$ = 0.03 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.012 $HQ_{avg\text{-}LOAEL}$ = 0.003	Dioxin TEQs are detected in sediment, plants, and invertebrates but do not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint.	No
	Dioxin TEQ[1] (Adjusted TRV)	**$HQ_{95\%UCL\text{-}NOAEL}$ = 1.2 $HQ_{avg\text{-}NOAEL}$ = 0.3 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.12 $HQ_{avg\text{-}LOAEL}$ = 0.03**	**Modeled risk predominantly attributable to exposure to sediment. Use of more conservative NOAEL resulted in modeled HQ greater than 1.0**	**NA**	**Yes**
	Dioxin TEQ[2] (Unadjusted TRV)	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.63 $HQ_{avg\text{-}NOAEL}$ = 0.13 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.06 $HQ_{avg\text{-}LOAEL}$ = 0.01	Dioxin TEQs are detected in sediment and invertebrates but do not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0), in all scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint.	No
	Dioxin TEQ[2] (Adjusted TRV)	**$HQ_{95\%UCL\text{-}NOAEL}$ = 6.3 $HQ_{avg\text{-}NOAEL}$ = 1.3 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.6 $HQ_{avg\text{-}LOAEL}$ = 0.1**	**Modeled risk predominantly attributable to exposure to sediment. Use of more conservative NOAEL resulted in modeled HQ greater than 1.0**	**NA**	**Yes**
	Mercury	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.71 $HQ_{avg\text{-}NOAEL}$ = 0.31 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.07 $HQ_{avg\text{-}LOAEL}$ = 0.03	Mercury is detected in sediment and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) all scenarios, mercury has not been retained as a final ecological COC for this endpoint.	No
	Chromium	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.08 $HQ_{avg\text{-}NOAEL}$ = 0.02 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.02 $HQ_{avg\text{-}LOAEL}$ = 0.004	Chromium is detected in sediment and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No
	Zinc	$HQ_{95\%UCL\text{-}NOAEL}$ = 0.08 $HQ_{avg\text{-}NOAEL}$ = 0.06 $HQ_{95\%UCL\text{-}LOAEL}$ = 0.01 $HQ_{avg\text{-}LOAEL}$ = 0.01	Zinc is detected in all media but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, zinc has not been retained as a final COPC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Alternative evaluation -95%UCL and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1 x 10^{-6} mg/kg-day) and LOAEL (1 x 10^{-5} mg/kg-day).

Table 8-10
Ecological Lines of Evidence for the Alternative Evaluation of the Insectivorous Avian Endpoint (Barn Swallow)

ENDPOINT	COPCs	HQ EVALUATION ALTERNATIVE SCENARIO	PATTERNS OF DETECTION	RATIONALE OF ELIMINATION	FINAL COC
Insectivorous Avian Species	Dioxin TEQ[1] (Unadjusted TRV)	$HQ_{95\%UCL-NOAEL} = 0.32$ $HQ_{avg-NOAEL} = 0.29$ $HQ_{95\%UCL-LOAEL} = 0.03$ $HQ_{avg-LOAEL} = 0.03$	Dioxin TEQ was detected in invertebrates and surface water but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, dioxin TEQ has not been retained as a final ecological COC for this endpoint.	No
	Dioxin TEQ[1] (Adjusted TRV)	$HQ_{95\%UCL-NOAEL} = 3.2$ $HQ_{avg-NOAEL} = 2.9$ $HQ_{95\%UCL-LOAEL} = 0.32$ $HQ_{avg-LOAEL} = 0.29$	**The modeled risk is attributable to dioxins detected in emergent insects.**	**NA**	**Yes**
	Dioxin TEQ[2] (Unadjusted TRV)	$HQ_{95\%UCL-NOAEL} = 1.7$ $HQ_{avg-NOAEL} = 1.5$ $HQ_{95\%UCL-LOAEL} = 0.17$ $HQ_{avg-LOAEL} = 0.15$	The modeled risk for this endpoint is greater than 99% attributable to the dioxin TEQ concentration in invertebrates.	NA	Yes
	Dioxin TEQ[2] (Adjusted TRV)	$HQ_{95\%UCL-NOAEL} = 17$ $HQ_{avg-NOAEL} = 15$ $HQ_{95\%UCL-LOAEL} = 1.7$ $HQ_{avg-LOAEL} = 1.5$	**The modeled risk is attributable to dioxins detected in emergent insects.**	**NA**	**Yes**
	Mercury	$HQ_{95\%UCL-NOAEL} = 1.1$ $HQ_{avg-NOAEL} = 0.8$ $HQ_{95\%UCL-LOAEL} = 0.11$ $HQ_{avg-LOAEL} = 0.08$	The modeled risk for this endpoint is greater than 99% attributable to the mercury concentration in invertebrates. Only modeled exposure using the maximum observed concentration resulted in a HQ greater than 1.0. Observed mercury concentrations in emergent insects from Welch Creek are consistent with background reported in the literature.	NA	Yes
	Chromium	$HQ_{95\%UCL-NOAEL} = 0.02$ $HQ_{avg-NOAEL} = 0.01$ $HQ_{95\%UCL-LOAEL} = 0.004$ $HQ_{avg-LOAEL} = 0.002$	Chromium is detected in the invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, chromium has not been retained as a final ecological COC for this endpoint.	No
	Zinc	$HQ_{95\%UCL-NOAEL} = 0.55$ $HQ_{avg-NOAEL} = 0.50$ $HQ_{95\%UCL-LOAEL} = 0.06$ $HQ_{avg-LOAEL} = 0.06$	Zinc is detected in surface water and invertebrates but does not result in modeled HQs>1.0 under any exposure scenario.	Given low modeled HQs (=1.0) in all scenarios, zinc has not been retained as a final ecological COC for this endpoint.	No

(1) TEQ based on I-TEFs (USEPA, 1987)
(2) TEQ based on WHO avian TEFs (1998)
Alternative evaluation - 95%UCL and average concentrations and NOAEL and LOAEL based
Shaded rows indicate the use of the more conservative adjusted NOAEL (1×10^{-6} mg/kg-day) and LOAEL (1×10^{-5} mg/kg-day).