**From:** Booth, Steven R[redacted]
**Sent:** Wednesday, April 04, 2012 2:02 PM
**To:** McKee, Steven D; Kornreich, Drew E; Isaacson, John; Dimarzio, John A.; Maheras, Steven J; Reddick, Randy; Waldman, Gilbert H.
**Subject:** Worker Dose Final-Final

Upon discussion with Drew Kornreich, John Dimarzio, and others, I have decided to go forward with the 764 mrem worker dose rather than the 500 mrem used by SRS. This provides us more conservatism for NEPA bounding. The relevant numbers for Table C-44 and elsewhere in the SEIS are shown below. I will make changes in the Draft SEIS based on this table.

**Suggested Modifications to Table C-44 of Final Draft SEIS**

| | |
|---|---|
| Operational Years--PDC | 10 |
| Operational Years--LANL Action {1} | 13.6 |
| Operational Years--LANL No Action | 8 |

| Impact Area | PDCF | LANL (No Action) | LANL (Action) | LANL (Action)--Mod {2} |
|---|---|---|---|---|
| Number radiation workers | 383 | 85 | 253 | 253 |
| Total workforce dose (person-rem per year) | 192 | 29 | 443 | 193 |
| Annual LCFs | 0.11 | 0.02 | 0.27 | 0.12 |
| Total LCFs | 1 | 0 | 6 | 2 |
| Average worker dose (millirem per year) | 500 | 341 | 1,751 | 764 |
| Annual LCF Risk | 0.0003 | 0.0002 | 0.001 | 0.0005 |
| Total LCF Risk | 0.0030 | 0.0016 | 0.02 | 0.0062 |

{1} Total throughput is 34 MT divided by 2.5MT/y peak production to calculate total workforce dose.
{2} Extrapolation of actual worker dose in UPOP during FY2011 to match 2.5 MT/y SPD program throughput equals 382 mrem/y-person average dose. This dose was doubled to 764 to provide NEPA bounding.

**From:** Booth, Steven R [redacted]
**Sent:** Wednesday, April 04, 2012 7:24 PM
**To:** Waldman, Gilbert H.
**Cc:** Dimarzio, John A.
**Subject:** FW: LANL worker dose , NEW-new Numbers

Gil:

I have modified the information on worker dose as compared to info provided to you on March 15.

**Estimated annual average dose to involved (badged) workers (hands-on workers intimate with processing activities) for the Action Alternative (mrem/yr): per worker = 764 person-mrem/yr; total for all workers = 193 person-rem/yr (764 * 253).**

Also: to compute the total LCFs, you need to use the number of years to complete a 34 MT total mission at the maximum rate reflected by the per worker average dose: **13.6 years = 34 MT/ 2.5 MT/y.**

**Suggested Modifications to Table C-44 of Final Draft SEIS**

| | |
|---|---|
| Operational Years--PDC | 10 |
| Operational Years--LANL Action {1} | 13.6 |
| Operational Years--LANL No Action | 8 |

| Impact Area | PDCF | LANL (No Action) | LANL (Action) | LANL (Action)--Modified {2} |
|---|---|---|---|---|
| Number radiation workers | 383 | 85 | 253 | 253 |
| Total workforce dose (person-rem per year) | 192 | 29 | 443 | 193 |
| Annual LCFs | 0.11 | 0.02 | 0.27 | 0.12 |
| Total LCFs | 1 | 0.14 | 6 | 1.6 |
| Average worker dose (millirem per year) | 500 | 341 | 1,751 | 764 |
| Annual LCF Risk | 0.0003 | 0.0002 | 0.001 | 0.0005 |
| Total LCF Risk | 0.0030 | 0.0016 | 0.02 | 0.0062 |

{1} Total throughput is 34 MT divided by 2.5MT/y peak production to calculate total workforce dose.
{2} Extrapolation of actual worker dose in UPOP during FY2011 to match 2.5 MT/y SPD program throughput equals 382 mrem/y-person average dose. This dose was doubled to 764 to provide NEPA bounding.

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**From:** Booth, Steven R
**Sent:** Thursday, March 15, 2012 2:11 PM
**To:** 'Waldman, Gilbert H.'; 'Owens, Kirk W.'
**Cc:** 'Dimarzio, John A.'; Kornreich, Drew E; 'Reddick, Randy'
**Subject:** FW: LANL worker dose , NEW Numbers

Gil:

The change in assumed isotopic composition of Pu to include 1% Am-241 necessitates an adjustment in worker dose for LANL. Previously Los Alamos assumed 0.3% Am content for the Action alternative. The adjusted dose numbers are highlighted below. There is no change to the No Action doses.

Steve.

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**From:** Waldman, Gilbert H. [redacted]
**Sent:** Wednesday, March 07, 2012 10:43 AM
**To:** Booth, Steven R
**Subject:** LANL worker dose closure
**Importance:** High

Hi Steve. Received your voicemail... thank you. I guess there are two separate outstanding items in need of closure: 1, The alignment of PDC source terms between SRS and LANL, and, 2. The estimated worker doses for PDC operations at PF-4. The first item, as I understand it, is presently being finalized between you and Steve Maheras. If there is any aspect of this of which you'd like to discuss (solubility factors and so forth), pls let me know. From what I understand from Kirk, I believe the path-forward and closure on this one has been essentially finalized?

For item #2, we are still uncertain from the last correspondence between you and Kirk on exactly how to best proceed with the workforce (and average worker) dose estimates. In my opinion, the original LANL datacall response on the matter was more usable for estimating potential doses. If possible, if you can fill in the following values so that we are able to attain definitive closure on this item, it would be greatly appreciated:

**# of annual estimated average workers at PF-4 supporting the PDC Mission (No Action Alternative [2 MT]): 85**

**# of annual estimated average workers at PF-4 supporting the PDC Mission (Action Alternative): 253**

**Estimated annual average dose to involved (badged) workers (hands-on workers intimate with processing activities) for the No Action Alternative [2 MT] (mrem/yr): per worker = 0.34 person-rem/yr; total for all workers = 29 person-rem per year.**

**Estimated annual average dose to involved (badged) workers (hands-on workers intimate with processing activities) for the Action Alternative (mrem/yr): per worker = 1.75 person-rem/yr; total for all workers = 443 person-rem/yr (1.75 * 253).**

From the above, we will then of course be able to calculate the estimated annual dose to the entire involved workforce(s) simply by multiplying the two values.

Thanks very much for your assistance Steve...

-Gil

**Gilbert H. Waldman** | SAIC
Sr. Nuclear Engineer / Environmental Analyst | ILPSG
[redacted]
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