

Nest Box Monitoring Plan for the Upper Pajarito Canyon Watershed

<p>Introduction</p>	<p>This plan presents investigation reaches and analytical suites for insect samples collected in the upper Pajarito Canyon watershed, as specified in the "Pajarito Canyon Investigation Report, Revision 1" (PCIR) (LANL 2009, 106939, p. 98). This plan addresses uncertainties in exposure from chemicals of potential ecological concern (COPECs) for invertebrate-eating birds.</p> <p>The study design COPECs for the cavity-nesting bird studies that are included in this plan are the metals cadmium, copper, lead, mercury, vanadium, and zinc, and the polychlorinated biphenyls (PCBs) Aroclor-1248 and Aroclor-1254, based on the evaluation presented in PCIR (LANL 2009, 106939, p. 77). As discussed in PCIR, insects collected from nest boxes in five reaches were analyzed for inorganic COPECs. The concentrations of some COPECs in insects collected from a single location in reach AW-1 were greater than other Pajarito watershed insect samples and were well outside the range of concentrations reported from other canyons. In addition, no analyses were obtained for mercury or PCBs because of insufficient sample mass. The single set of relatively high results, the small number of samples, and the incomplete analytical suite resulted in uncertainties concerning potential ecological risk and a recommendation for additional monitoring. Monitoring of nest boxes in the upper Pajarito watershed continued in 2009, including the collection of additional insect samples for analyses to address these uncertainties.</p>
<p>Approach</p>	<p>Insects collected from nest boxes occupied in 2009 in reaches AW-1, PAS-1E, PA-2W, and TWSE-1W will be analyzed for key COPECs, as allowed by available sample mass and target detection limits. These samples will provide a comparison between reaches close to contaminant sources with relatively high COPEC concentrations (AW-1, PAS-1E, and TWSE-1W) and a downcanyon reach with lower COPEC concentrations (PA-2W). In addition, insect samples have been collected from nest boxes on an adjacent mesa in Technical Area 14 (TA-14), which serves as a local reference area. Nest box locations are shown on Figure 8.1-1 of PCIR (LANL 2009, 106939, p. 145). Insects will be sorted from other items collected from the nest boxes, weighed, and identified before analysis. Insects from each reach will be composited to increase sample mass before they are submitted to analytical laboratories. COPEC concentrations will be tested for relationships with reproductive parameters of nest productivity.</p>
<p>Analyte Suites, Target Detection Limits, and Planned Analyses</p>	<p>Insect samples will be analyzed using up to three methods, depending on available sample mass. The target detection limits will be those specified for earthworms in the "Pajarito Canyon Biota Investigation Work Plan" (LANL 2006, 093553, Table 5.1-2, p. 32) and are presented in Table 1, along with the required sample mass. Metals obtained with the U.S. Environmental Protection Agency (EPA) Method 6010A (including cadmium, copper, lead, vanadium, and zinc) will be obtained first, followed by mercury using EPA Method 7471 and PCBs using EPA Method 8082 if sufficient sample mass is available. This prioritization is consistent with the original biota plan (LANL 2006, 093553, Table 5.2-1, p. 33). The original plan also included semivolatile organic compounds (SVOCs) as a lower priority, but the mass will be insufficient for these analyses; therefore, SVOCs are not included in this plan. Table 2 presents estimated dry weights for insects collected from each area (assuming 1.5 g dry weight per box) and planned analyses.</p>
<p>Reporting</p>	<p>Analytical results from insect samples will be presented in a report to be submitted to the New Mexico Environment Department by August 31, 2010. This report will include an evaluation of these data in the context of potential ecological risk and recommendations for future work, if appropriate.</p>

REFERENCES

The following list includes all documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the New Mexico Environment Department Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), July 2006. "Pajarito Canyon Biota Investigation Work Plan," Los Alamos National Laboratory document LA-UR-06-4106, Los Alamos, New Mexico. (LANL 2006, 093553)

LANL (Los Alamos National Laboratory), August 2009. "Pajarito Canyon Investigation Report, Revision 1," Los Alamos National Laboratory document LA-UR-09-4670, Los Alamos, New Mexico. (LANL 2009, 106939)

Table 1
Target Detection Limits and Required Sample Mass

Suite	COPEC	Chemical Abstract Service (CAS) ID	Analytical Method	Target Minimum Quantitation Limit (mg/kg)	Required Dry Weight (g)
Metal	Cadmium	7440-43-9	EPA Method 6010A	1.12	0.44
Metal	Copper	7440-50-8	EPA Method 6010A	1.96	0.51
Metal	Lead	7439-92-1	EPA Method 6010A	1.05	0.29
Metal	Mercury	7439-97-6	EPA Method 7471	0.01	0.6
Metal	Vanadium	7440-62-2	EPA Method 6010A	0.72	1.40
Metal	Zinc	7440-66-6	EPA Method 6010A	24.8	0.081
PCB	Aroclor-1248	12672-29-6	EPA Method 8082	0.016	12.65
PCB	Aroclor-1254	11097-69-1	EPA Method 8082	0.07	2.89

Table 2
Planned Analyses

Reach or Area	Estimated Sample Weight (g)	Sampled Boxes	EPA Method 6010A Metals	Mercury	PCBs
AW-1	9	843, 844, 845, 847, 848, 849	X ^a	X	X or — ^b
PAS-1E	9	850, 852, 854, 855, 856, 857	X	X	X or —
PA-2W	3	794, 803	X	X	—
TWSE-1W	19	831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841	X	X	X
TA-14 Mesa	6	823, 826, 827, 830	X	X	X or —

^a X = Sufficient mass is probably available for analyses at desired detection limits.

^b — = Sufficient mass is probably unavailable for analysis of some or all Aroclors at desired detection limits.

