CHAPTER 6.0
ALTERNATIVES EVALUATION

Each alternative was simulated for a 3.75-year time period (October 1996 – June 2000) using the HSPF model. The results from the first year were not used to allow adequate time for the numerical model to reach a dynamic equilibrium. Therefore, nutrients were evaluated based on the average annual load (lbs/yr) over the last 2.75 years of the model results. The model output location for each of the three creeks was established at the downstream City limit (Figures 6.1, 6.2, and 6.3). Thus, the model results reflect the alternative restoration measures upstream of the output location.

The reduction in average annual loading (expressed as a percentage) at each output location was determined for each alternative and then compared to the loading under existing conditions. Table 6.1 presents the results of the model simulations, which are further summarized in the sections below.

6.1 HISTORICAL LAND USE EVALUATION

For the Historical Land Use scenario, all three creeks show notable reductions in loading ranging from 86% to 98% for nitrate, ammonia, and phosphate. The large percentage of potential nutrient loading reduction indicates that the major contribution of nutrients in both watersheds is from human and urban uses. The results also indicate there is a small quantity of nutrient loading attributable to natural sources (e.g., soil erosion and wildlife). Therefore, to achieve a 100% reduction in nutrients may require reductions in loading attributable to natural as well as human sources.

6.2 CREEK RESTORATION ALTERNATIVE

The Creek Restoration Alternative was found to have no detectable impact on nutrient loading for all three creeks. The simulations were based on implementation of all identified creek restoration opportunities within each creek, including bank stabilization, concrete removal, and vegetation clearing. Since the creek restoration opportunities focused primarily on hydrologic and/or habitat changes within the creek channel, neither the nutrient loadings from the watershed nor the water quality processes within the creek were substantially modified through

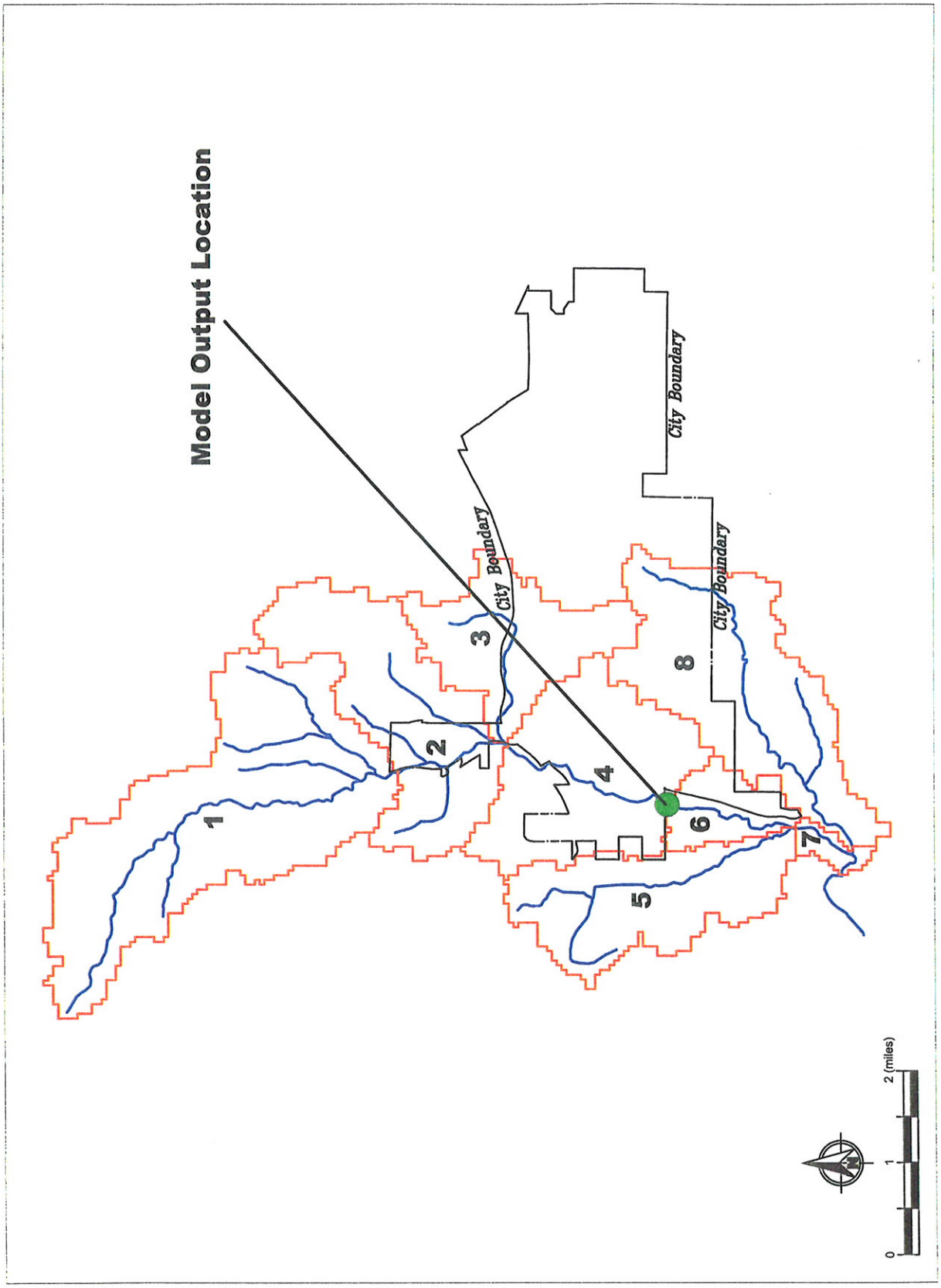

Figure 6.1
Model Output Location for Las Virgenes Creek

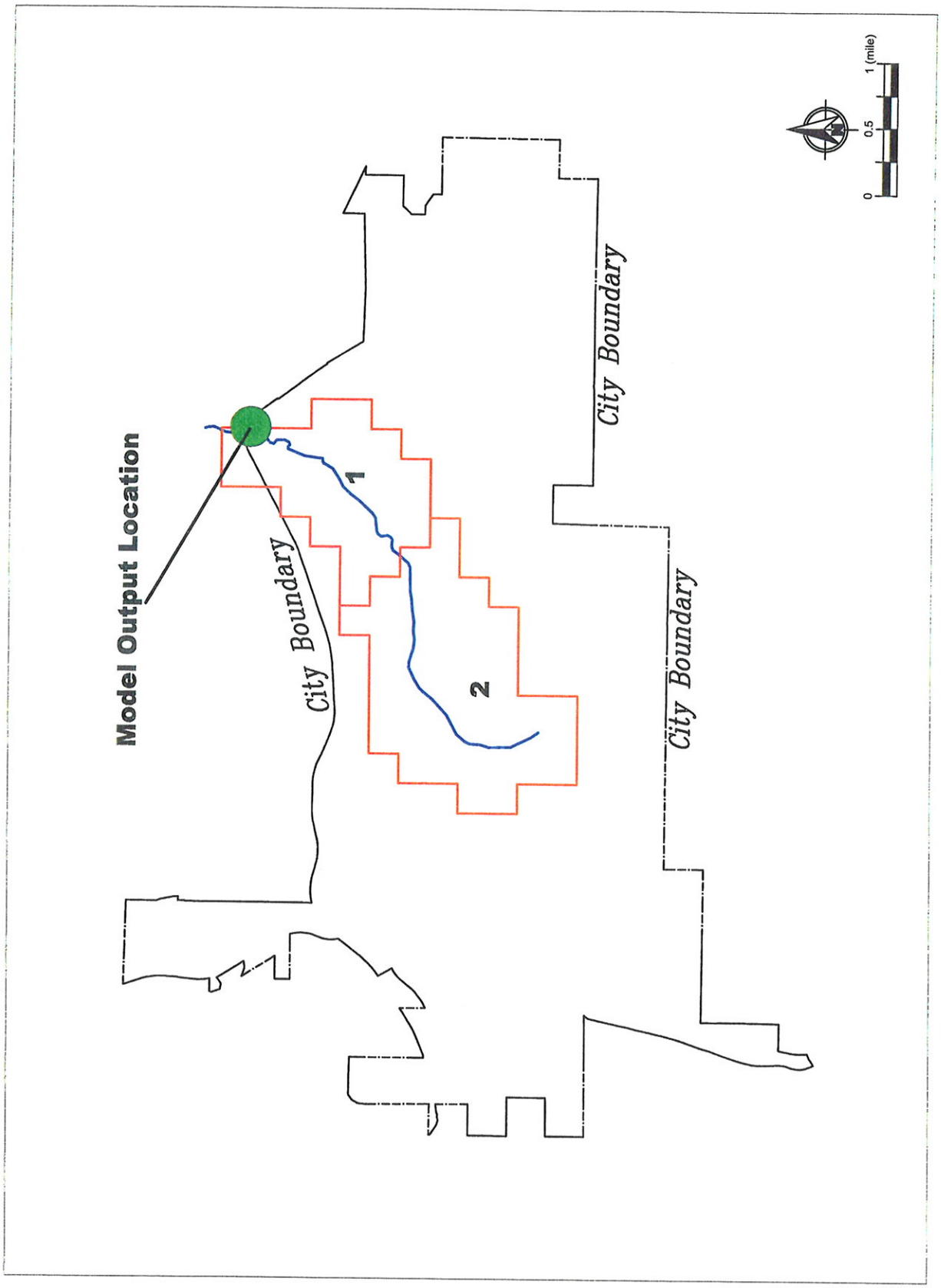

Figure 6.2
Model Output Location for McCoy Creek

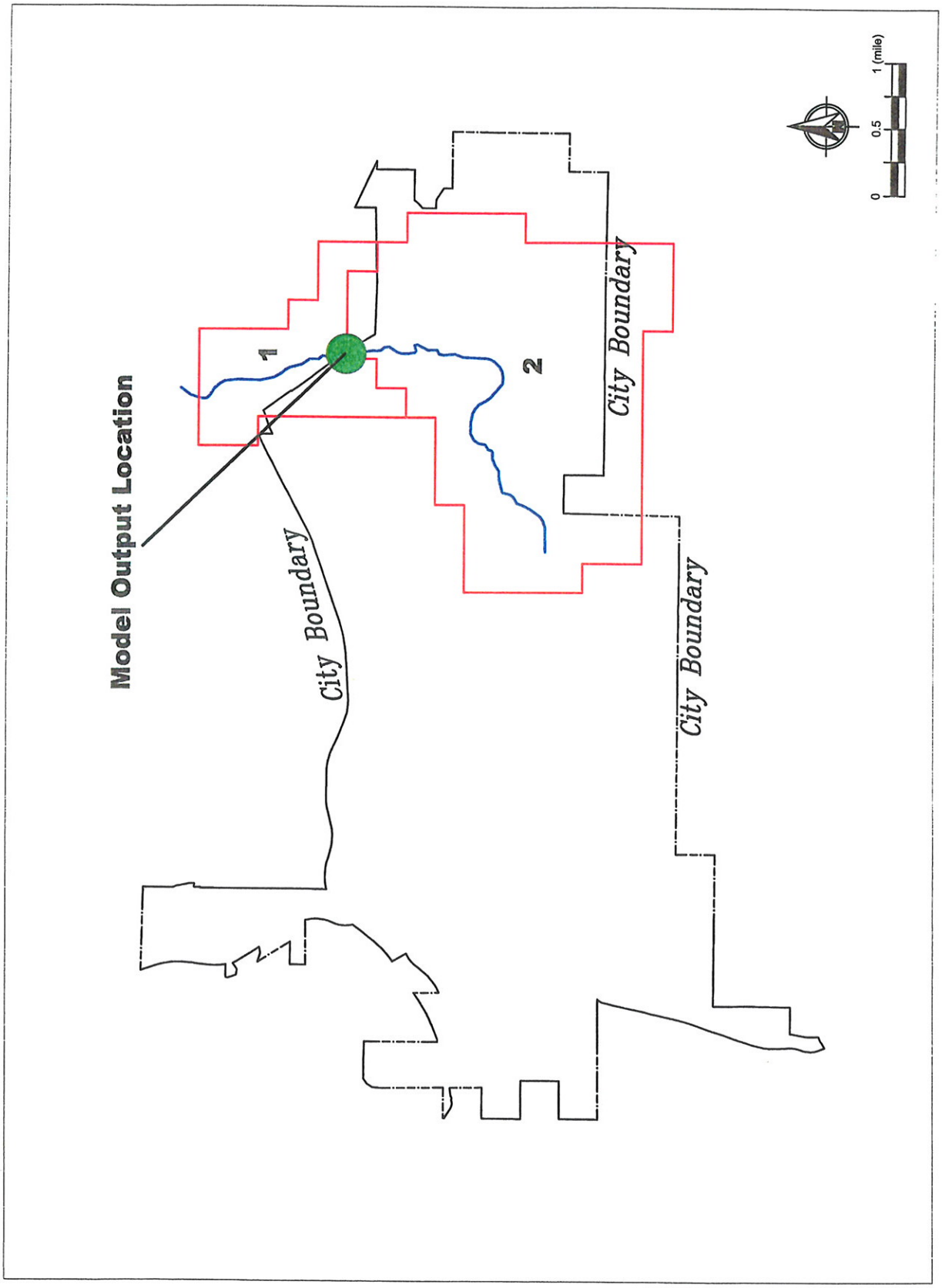

Figure 6.3
Model Output Location for Dry Canyon Creek

Table 6.1. Nutrient Loading Reductions by Alternative

Alternative	Creek	Percent Reduction (%)		
		Nitrate	Ammonia	Phosphate
Historical Land Use	Las Virgenes Creek	91	86	86
	McCoy Creek	98	96	98
	Dry Canyon Creek	98	98	93
Creek Restoration Alternative	Las Virgenes Creek	0	0	0
	McCoy Creek	0	0	0
	Dry Canyon Creek	0	0	0
Alternative 1A	Las Virgenes Creek	4	19	16
	McCoy Creek	2	13	7
	Dry Canyon Creek	5	28	21
Alternative 1B	Las Virgenes Creek	7	39	32
	McCoy Creek	4	26	14
	Dry Canyon Creek	9	55	42
Alternative 2A	Las Virgenes Creek	21	5	4
	McCoy Creek	16	3	8
	Dry Canyon Creek	17	2	2
Alternative 2B	Las Virgenes Creek	41	10	7
	McCoy Creek	33	6	15
	Dry Canyon Creek	35	4	5

implementation of the creek restoration measures. The model results of restoration alternatives for all three creeks indicated that nutrient loading would not be meaningfully affected through implementation of these measures. However, there could be water quality improvements for other pollutants if the identified restoration measures were implemented.

6.3 WATERSHED MANAGEMENT ALTERNATIVE 1—STRUCTURAL BMPS

The results of Watershed Management Alternative 1 modeling indicate that structural BMPs are more effective in reducing ammonia and phosphate loading than nitrate loading. Alternatives 1A and 1B provide a range of reduction based on the amount of runoff treated and the effectiveness of the various BMPs. The quantity of runoff treated with structural BMPs directly impacts the nutrient reduction such that nutrient loading is reduced in proportion to the volume of treated runoff. The percent reductions for Alternative 1B are approximately twice that of Alternative 1A, which corresponds to the treatment of twice as much runoff in Alternative 1B compared to Alternative 1A.

6.4 WATERSHED MANAGEMENT ALTERNATIVE 2—SOURCE CONTROL MEASURES

Watershed Management Alternatives 2A and 2B provided a range in nutrient reductions associated with implementation of a range in nutrient source control measures. Doubling the source control reduction from Alternative 2A (25%) to Alternative 2B (50%) approximately doubled the nutrient loading reduction. The source control measures are the most effective for nitrate reduction and less effective at reducing the loading for ammonia and phosphate.