

### 3.0 SOURCE CHARACTERISTICS AND RECEPTOR CONFIGURATION

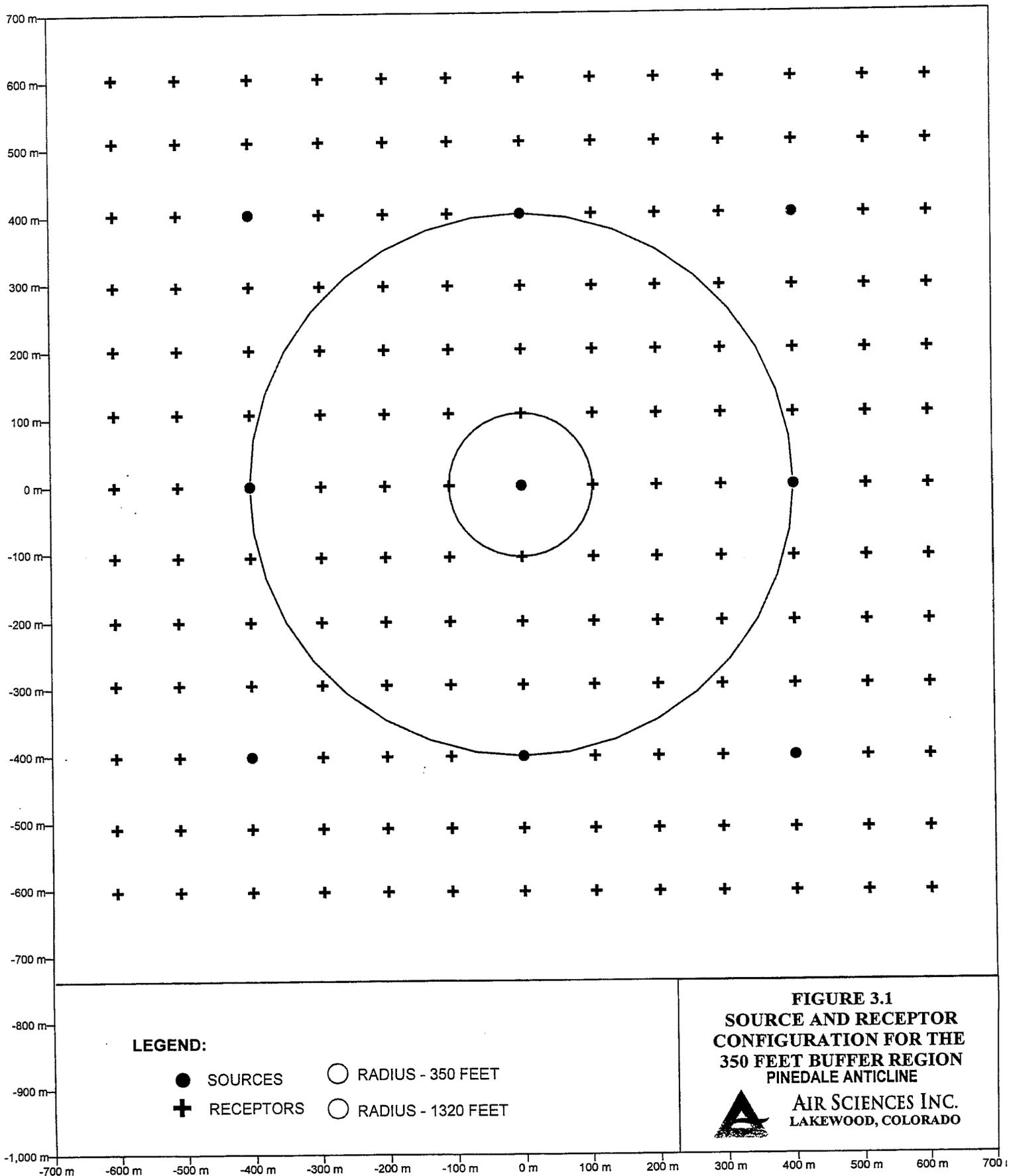
#### 3.1 Source Configuration and Emissions

Because well production impacts decrease with distance, long-term health effects from toxic emissions are of greatest concern for residents located near these emissions sources. The impacts are therefore estimated on a relatively small scale (i.e., receptors placed from 350 feet to one mile from the emissions sources). At the short distances considered in this analysis, the primary influences on impacts are the nearest individual sources. A reasonable estimate of maximum impacts is provided at the central locations of a cluster of nine wells at the maximum density spacing of 16 wells per square mile. For this analysis, nine wells are selected because they are thought to cause the vast majority of the impact at the central receptors. Figure 3.1 shows the source and receptor configuration.

In a chronic impact analysis, the annual production emissions are modeled. Construction emissions last only a short while and will not contribute significantly to chronic effects so they are not considered. There are four sources of toxin production emissions: three-phase separator heater, dehydration heater, dehydrator, and flashing. The total emissions per well of each toxic pollutant are summarized in Table 3.1. It is assumed that each of the 9 wells produces 0.5 million cubic feet per day (MMCFD) of gas and 4.5 barrels of condensate per day (BPD). (See Attachment B for emissions calculations.) None of the emissions sources at the well sites are assumed to be large enough to require best available control technology (BACT), and therefore no controls are assumed. This combination of assumptions (i.e., average production rate, no BACT) is expected to result in a reasonable estimate of a maximum density of emissions.

TABLE 3.1  
PER WELL EMISSIONS SUMMARY

Hazardous Air Pollutant	lb/hour	tons/year	grams/second
Benzene	0.08	0.34	0.010
Ethylbenzene	0.01	0.06	0.002
Formaldehyde	$1.0 \times 10^{-5}$	$4.6 \times 10^{-5}$	$1.3 \times 10^{-6}$
n-Hexane	0.11	0.47	0.013
Toluene	0.19	0.83	0.024
Xylenes	0.16	0.71	0.020



In this modeling analysis, each well has four emissions sources and each of the four emissions sources is modeled as a point source. Thus, each well is represented as four co-located point sources. Table 3.2 summarizes the stack parameters used in the modeling.

TABLE 3.2  
STACK PARAMETER SUMMARY

	H (m)	T (K)*	V (m/s)	D (m)
SeperatorHeater	4.5	700	6.1	0.3
Glycol Heater	4.5	700	6.1	0.3
Dehydrator vent	4.5	289	0.01	0.15
Flashing	3.0	0	0.01	0.08

\*A temperature of 0K indicates ambient temperature.

### 3.2 Receptor Configuration

The receptors are placed 350 feet (106.7 meters) from each of the nine wells, and approximately 100 meters apart in the areas between wells. (See Figure 3.1.) Beyond the immediate region of the wells, receptor spacing is approximately 100 and 200 meters. To reflect the restriction that wells be placed at least 350 feet from an existing residence, receptors are not placed within 350 feet of any well.

Impacts from benzene are also predicted using a receptor-source configuration that assumes a 1,320 feet (0.25 mile) buffer region between sources and receptors. This buffer region is characteristic of the source-receptor spacing requirement on federal land. This alternate configuration is shown in Figure 3.2, and the results are discussed in Section 5. Note that for this scenario the center well is replaced with a receptor to meet the minimum receptor-source distance requirements of 1,320 feet.

