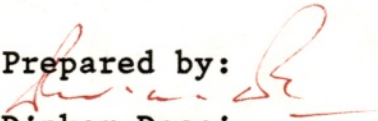


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for
Natural Gas Pipe Lines

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Prepared by:


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Environmental Engineer
Date: 18 May 1993

Environmental Assessment
for
Natural Gas Pipe Lines

A. INTRODUCTION

The following Environmental Assessment (EA), has been prepared prior to the proposed action and in accordance with the requirement of Army Regulation (AR) 200-2. The basic objectives specified in AR 200-2 are to plan, initiate and perform all actions/programs with consideration given to minimize adverse effects on the quality of human environment without impairment to the Army mission. The scope of this assessment covers the abandonment of existing old natural gas lines and construct the new natural gas lines.

B. NEED FOR PROPOSED ACTION

The existing gas lines are old and aged. The lines leak frequently, and if we continue to use for a long time it could create health and safety hazards.

C. DESCRIPTION OF PROPOSED ACTION

In addition to replacing existing gaslines, the additional gas lines will be installed throughout the base except Evans Area, inconjunction with the conversion of existing oil-fired heating equipment (boilers and furnaces) to natural gas. Most of the new piping is going to be constructed within or adjacent to the existing area. Under the proposed plan, New Jersey Natural Gas Co. will install approximately 10 miles of piping. The detailed economic analysis is attached as Appendix A. All abandoned gas lines will be purged and capped, for safety purposes as ensured by New Jersey Natural Gas Co. Directorate of Engineering and Housing will make sure that the lines are purged and capped before the abandonment.

D. ALTERNATIVES CONSIDERED

1. Status quo, 5 pig system

This alternative would continue the current method of providing natural gas to and throughout Fort Monmouth. Fort Monmouth would purchase natural gas from New Jersey Natural Gas (NJNG) and

distribute in existing 5 psi mains and services that are owned and operated by Fort Monmouth. In addition, all remaining fuel oil plants will be converted into natural gas and the entire distribution system would remain at 5 psig.

2. NJNG 100% ownership

Under this alternative, Fort Monmouth would continue to purchase natural gas from NJNG, but NJNG will install, at their expense, a new 60 psi distribution system, and would own and maintain the natural gas lines on Fort Monmouth. Metering points would be installed in every facility and Fort Monmouth pay a commercial monthly charge.

E. ENVIRONMENTAL IMPACT OF PROPOSED ACTION

1. The proposed action will improve the boiler and furnace efficiency, by converting to natural gas, burn less fuel than oil. The energy consumption will be reduced. The primary concern was to evaluate the safety of leaving existing gas lines in the ground. This should be alleviated by purging the lines before the abandonment.

2. WATER QUALITY

Surface drainage from the proposed site will be collected by stormdrains and subsequently discharged into river via brooks. This is not expected to have significant impact on surface water quality.

3. AIR QUALITY

By converting the major facility from oil to natural gas use, the facilities will emit less air emissions than present. That will be a significant improvement from the present conditions.

4. SOLID WASTE

Solid Waste generated resulting from the construction will be minimal and will be disposed or recycled in accordance with state regulations.

5. LAND USE

The proposed line will be constructed along the path of existing lines so the change in land use should not be altered and it should not have significant impact on human environment.

6. NOISE

Exterior noises emanating from the construction equipments pertaining to the proposed project will not have significant impact on human environment.

7. FLORA AND FAUNA

No endangered species of plants or animals have been identified in or near the site.

8. HISTORICAL/ARCHAEOLOGICAL SITES

a. A review of the installation of new gas lines, to be performed by New Jersey Natural Gas Co. was made and compared to "An Archeological Overview and Management Plan for Fort Monmouth (Main Post), Camp Charles Wood and the Evans Area" prepared by Envirosphere Company for U.S. Army Materiel Development and Readiness Command in October 1984.

b. By superimposing the new main lines and archeological sites onto maps of Fort Monmouth, it has been determined that the proposed project will not interfere with the majority of known or potential archeological sites. It is important to note that in every case where the new main lines interfere with either a known or potential archeological site, these sites are in areas designated as 60%-90% disturbed land thereby reducing the potential of archeological significance. Moreover, New Jersey Natural Gas Co. has agreed to be sensitive to archeological significant sites by rerouting pipes around them.

c. Specifically, the new main lines will not interfere with any potential archeological sites in the Evans Area (there are no known archeological sites in the Evans Area).

d. The interference in the Charles Wood Area is limited to the north end of Lowther Drive, the site on which Gibbs Hall is located, the Northwest corner of the Myer Center, and directly over Building 2106. In every case, disturbance in each of these areas has already occurred, and it is not likely that the installation of gas service in this area would further degrade the archeological value.

e. The Main Post is significantly impacted. Under this project, three known archeological sites (the site around Buildings 655-659, Building 814, and Building 864) would be impacted. As for the potential archeological sites, there are various locations where the new main lines would interfere with potential sites.

However, these areas are the most densely developed and have already been disturbed. Again, it is not likely that the installation of gas service in these areas would further degrade the archeological value. It is anticipated that the installation will proceed without any archeological impact.

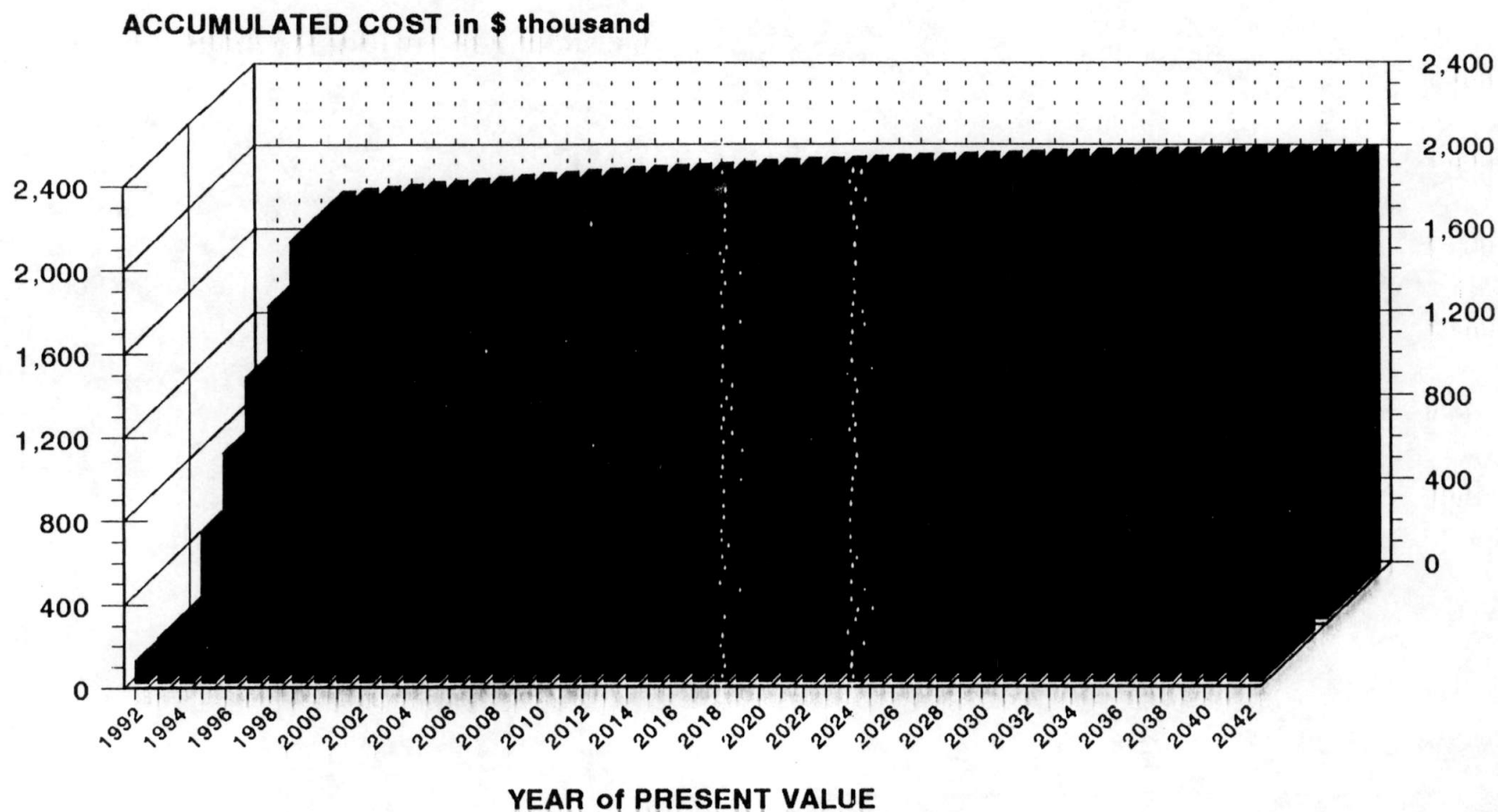
F. CONCLUSION

The proposed action is not expected to result in significant adverse impact on the human environment, nor it is environmental controversial. Therefore environmental impact statement is not required. In addition safety issue has also been address in this EA.

NJ NEW JERSEY NATURAL GAS COMPANY NJ

COMPARATIVE COST STUDY for THREE FACILITIES at FORT MONMOUTH

ACCUMULATED COST in PRESENT DOLLARS - 50 YEAR PROJECTION



ALTERNATIVE

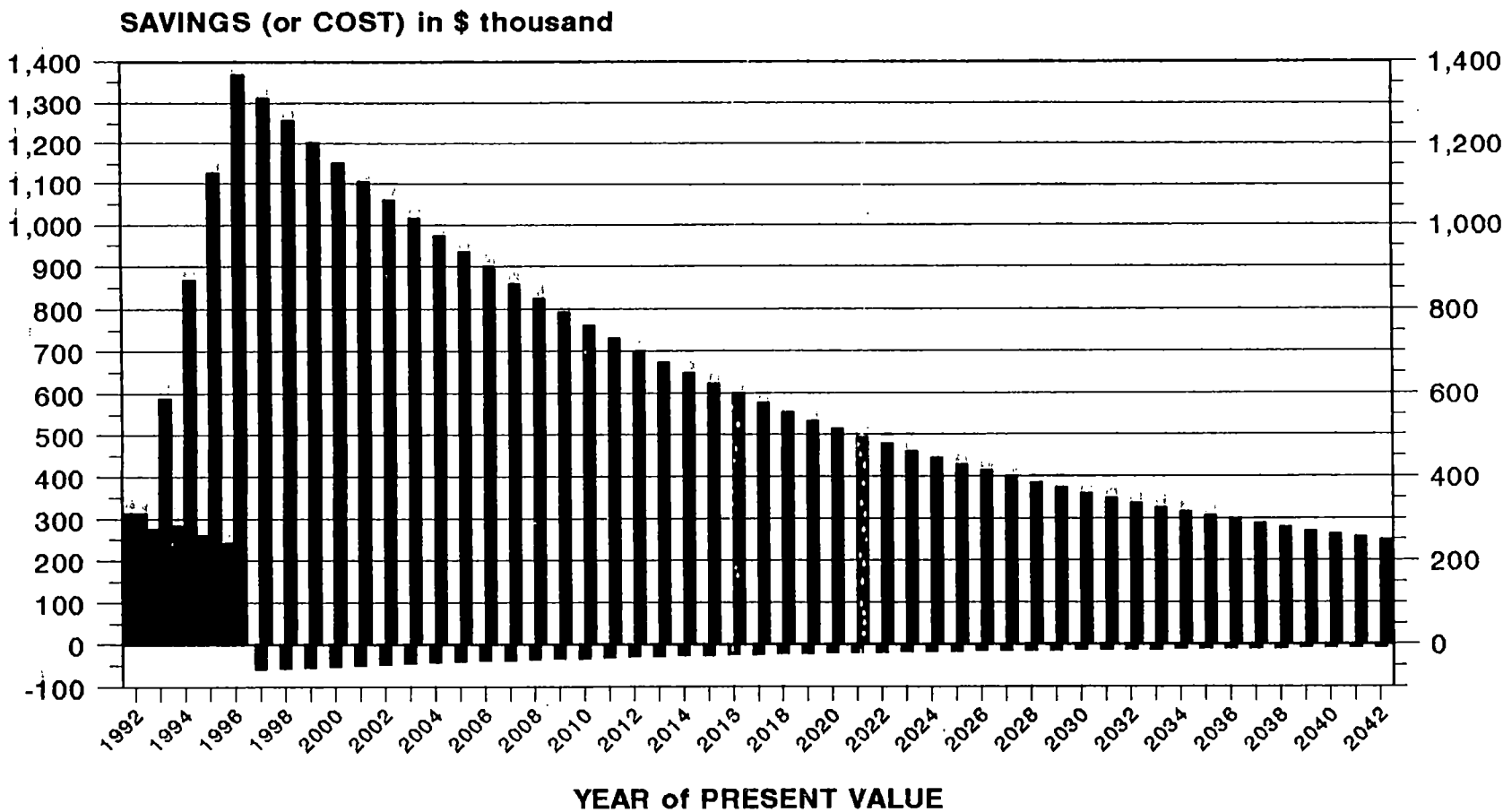
- A. NJNG OWNERSHIP
- B. FORT OWNERSHIP



NEW JERSEY NATURAL GAS COMPANY



DIFFERENTIAL COST STUDY for THREE FACILITIES at FORT MONMOUTH SAVINGS to FORT MONMOUTH for NJNG to OWN and OPERATE GAS SYSTEM



SAVINGS (COST) to FORT MONMOUTH - NJNG OWN and OPERATE

■ ANNUAL SAVINGS ■ ANNUAL COST ■ CUMM ANNUAL SAVINGS

NOTES for Present Value Cost Comparison:

General Assumptions and Conditions:

Annual inflation rate	5.0%
Interest rate or discount rate	10.0%
monthly customer service charge	\$13.81 /meter

1. Cost comparison incurred by Fort Monmouth for smooth conversion of existing and proposed loads from oil to natural gas.
2. Natural gas service to 524 buildings noted in Fort Monmouth data are:
 - a. oil conversions and
 - b. increased loads as required.
3. Projection of future (inflationary) values and return to present (discount) value are based on annual inflation and investment interest rates shown above.
4. Annual cost of repair to existing main & services = \$3,901/mile
Annual cost for operating and maintenance O&M = \$719/mile

Alternative A. 100% NJNG Ownership

4. All buildings proposed are to be serviced with individual meters, on 60 psig distribution system.
5. Monthly customer charges reflect current Commercial Rate charge per meter.
6. NJNG construction of main replacement and main extension will be performed in two years.

Alternative B. 100% Fort Monmouth Ownership

7. Fort Monmouth's proposed and replacement main and services are at costs comparable to unit costs generated from NJNG's historical records of construction.
8. Fort Monmouth construction to be completed in five (5) years.
9. Oil to gas maintenance transition to be made in same five year period. Oil maintenance costs not included.
10. Gas operating and maintenance costs, including main repair, are generated by NJNG's historical records.
11. Master meters and five (5) psig system will remain in the future.

Alternative by facility and function	year no of years	1992 0	1993 1	1994 2	1995 3	1996 4	1997 5	1998 6	
A. 100% NJNG Ownership		12 miles of 60 psig pipeline system with 524 meters and services							
Main Base facility									
annual meter charge for 262 meters	<i>261</i> \$43,419	21,709	45,590	47,869	50,263	52,776	55,414	58,185	
existing main & service repairs per yr	\$39,011	39,011	20,481						
Charles Wood facility (w/ Wherry House)									
annual meter charge for 148+60 meters	\$34,470	17,235	36,193	38,003	39,903	41,898	43,993	46,193	
existing main & service repairs per yr	\$15,967	15,967	8,382						
Camp Evans facility									
annual meter charge for 54 meters	<i>53</i> \$8,949	4,474	9,396	9,866	10,359	10,877	11,421	11,992	
existing main & service repairs per yr	\$5,179	5,179	2,719						
A. NET PRESENT VALUE		\$1,777,732	103,576	111,601	79,122	75,526	72,093	68,816	65,688
B. 100% Fort Monmouth Ownership		15 miles of 5 psig pipeline system with 12 gas company meters							
Main Base facility									
annual meter charge for 2 meters	\$331	331	348	365	384	403	423	444	
main & service construction - 5 years	\$1,281,040	256,208	269,018	282,469	296,593	311,422			
gas O & M new main per year	\$8,080	1,616	3,394	5,345	7,483	9,821	10,312	10,828	
existing main/service repairs per year	\$39,011	39,011	32,769	25,806	18,064	9,484			
Charles Wood facility (w/ Wherry House)									
annual meter charge for 6 meters	\$994	994	1,044	1,096	1,151	1,209	1,269	1,332	
main & service construction - 5 years	\$358,215	71,643	75,225	78,986	82,936	87,083			
gas O & M new main per year	\$3,281	656	1,378	2,171	3,039	3,988	4,188	4,397	
existing main/service repairs per year	\$15,967	15,967	13,412	10,562	7,393	3,881			
Camp Evans facility									
annual meter charge for 4 meters	\$663	663	696	731	767	806	846	888	
main & service construction - 5 years	\$111,362	22,272	23,386	24,555	25,783	27,072			
gas O & M new main per year	\$629	126	264	416	583	765	803	843	
existing main/service repairs per year	\$5,179	5,179	4,351	3,426	2,398	1,259			
B. NET PRESENT VALUE		\$2,024,382	414,667	386,623	360,272	335,517	312,269	11,078	10,574

Alternative by facility and function	year no of years	1999	2000	2001	2002	2003	2004	2005	2006	
		7	8	9	10	11	12	13	14	
A. 100% NJNG Ownership 12 miles of 60										
Main Base facility										
annual meter charge for 262 meters	\$43,419	61,094	64,149	67,357	70,724	74,261	77,974	81,872	85,966	
existing main & service repairs per yr	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 148+60 meters	\$34,470	48,502	50,928	53,474	56,148	58,955	61,903	64,998	68,248	
existing main & service repairs per yr	\$15,967									
Camp Evans facility										
annual meter charge for 54 meters	\$8,949	12,592	13,222	13,883	14,577	15,306	16,071	16,874	17,718	
existing main & service repairs per yr	\$5,179									
A. NET PRESENT VALUE		\$1,777,732	62,702	59,852	57,132	54,535	52,056	49,690	47,431	45,275
B. 100% Fort Monmouth Ownership 15 miles of 5										
Main Base facility										
annual meter charge for 2 meters	\$331	-466	490	514	540	567	595	625	656	
main & service construction - 5 years	\$1,281,040									
gas O & M new main per year	\$8,080	11,369	11,938	12,535	13,161	13,819	14,510	15,236	15,998	
existing main/service repairs per year	\$39,011									
Charles Wood facility (w/ Wherry House) <i>3 mdy</i>										
annual meter charge for 6 meters	\$994	1,399	1,469	1,543	1,620	1,701	1,786	1,875	1,969	
main & service construction - 5 years	\$358,215									
gas O & M new main per year	\$3,281	4,617	4,848	5,090	5,345	5,612	5,893	6,187	6,497	
existing main/service repairs per year	\$15,967									
Camp Evans facility										
annual meter charge for 4 meters	\$663	933	979	1,028	1,080	1,134	1,190	1,250	1,312	
main & service construction - 5 years	\$111,362									
gas O & M new main per year	\$629	885	929	976	1,025	1,076	1,130	1,186	1,245	
existing main/service repairs per year	\$5,179									
B. NET PRESENT VALUE		\$2,024,382	10,094	9,635	9,197	8,779	8,380	7,999	7,635	7,288

Alternative by facility and function	year no of years	2007 15	2008 16	2009 17	2010 18	2011 19	2012 20	2013 21	2014 22	
A. 100% NJNG Ownership 12 miles of 60										
Main Base facility										
annual meter charge for 262 meters	\$43,419	90,264	94,777	99,516	104,492	109,717	115,203	120,963	127,011	
existing main & service repairs per yr	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 148+60 meters	\$34,470	71,660	75,243	79,005	82,956	87,103	91,459	96,031	100,833	
existing main & service repairs per yr	\$15,967									
Camp Evans facility										
annual meter charge for 54 meters	\$8,949	18,604	19,534	20,511	21,537	22,613	23,744	24,931	26,178	
existing main & service repairs per yr	\$5,179									
A. NET PRESENT VALUE		\$1,777,732	43,217	41,253	39,378	37,588	35,879	34,248	32,692	31,206
B. 100% Fort Monmouth Ownership 15 miles of 5										
Main Base facility										
annual meter charge for 2 meters	\$331	689	723	760	798	838	879	923	970	
main & service construction - 5 years	\$1,281,040									
gas O & M new main per year	\$8,080	16,797	17,637	18,519	19,445	20,417	21,438	22,510	23,636	
existing main/service repairs per year	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 6 meters	\$994	2,067	2,170	2,279	2,393	2,513	2,638	2,770	2,909	
main & service construction - 5 years	\$358,215									
gas O & M new main per year	\$3,281	6,821	7,163	7,521	7,897	8,292	8,706	9,141	9,598	
existing main/service repairs per year	\$15,967									
Camp Evans facility										
annual meter charge for 4 meters	\$663	1,378	1,447	1,519	1,595	1,675	1,759	1,847	1,939	
main & service construction - 5 years	\$111,362									
gas O & M new main per year	\$629	1,308	1,373	1,442	1,514	1,589	1,669	1,752	1,840	
existing main/service repairs per year	\$5,179									
B. NET PRESENT VALUE		\$2,024,382	6,957	6,641	6,339	6,051	5,776	5,513	5,263	5,023

Alternative	year	2015	2016	2017	2018	2019	2020	2021	2022	
by facility and function	no of years	23	24	25	26	27	28	29	30	
A. 100% NJNG Ownership		12 miles of 60								
Main Base facility										
annual meter charge for 262 meters	\$43,419	133,361	140,029	147,031	154,382	162,102	170,207	178,717	187,653	
existing main & service repairs per yr	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 148+60 meters	\$34,470	105,875	111,168	116,727	122,563	128,691	135,126	141,882	148,976	
existing main & service repairs per yr	\$15,967									
Camp Evans facility										
annual meter charge for 54 meters	\$8,949	27,487	28,861	30,304	31,819	33,410	35,081	36,835	38,677	
existing main & service repairs per yr	\$5,179									
A. NET PRESENT VALUE		\$1,777,732	29,787	28,433	27,141	25,907	24,729	23,605	22,532	21,508
B. 100% Fort Monmouth Ownership		15 miles of 5								
Main Base facility										
annual meter charge for 2 meters	\$331	1,018	1,069	1,122	1,178	1,237	1,299	1,364	1,432	
main & service construction - 5 years	\$1,281,040									
gas O & M new main per year	\$8,080	24,817	26,058	27,361	28,729	30,166	31,674	33,258	34,921	
existing main/service repairs per year	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 6 meters	\$994	3,054	3,207	3,367	3,535	3,712	3,898	4,093	4,297	
main & service construction - 5 years	\$358,215									
gas O & M new main per year	\$3,281	10,078	10,582	11,111	11,667	12,250	12,863	13,506	14,181	
existing main/service repairs per year	\$15,967									
Camp Evans facility										
annual meter charge for 4 meters	\$663	2,036	2,138	2,245	2,357	2,475	2,599	2,729	2,865	
main & service construction - 5 years	\$111,362									
gas O & M new main per year	\$629	1,932	2,029	2,130	2,237	2,348	2,466	2,589	2,719	
existing main/service repairs per year	\$5,179									
B. NET PRESENT VALUE		\$2,024,382	4,795	4,577	4,369	4,170	3,981	3,800	3,627	3,462

Alternative by facility and function	year no of years	2023 31	2024 32	2025 33	2026 34	2027 35	2028 36	2029 37	2030 38	
A. 100% NJNG Ownership 12 miles of 60										
Main Base facility										
annual meter charge for 262 meters	\$43,419	197,036	206,887	217,232	228,093	239,498	251,473	264,046	277,249	
existing main & service repairs per yr	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 148+60 meters	\$34,470	156,425	164,246	172,459	181,082	190,136	199,643	209,625	220,106	
existing main & service repairs per yr	\$15,967									
Camp Evans facility										
annual meter charge for 54 meters	\$8,949	40,610	42,641	44,773	47,012	49,362	51,830	54,422	57,143	
existing main & service repairs per yr	\$5,179									
A. NET PRESENT VALUE		\$1,777,732	20,531	19,597	18,707	17,856	17,045	16,270	15,530	14,824
B. 100% Fort Monmouth Ownership 15 miles of 5										
Main Base facility										
annual meter charge for 2 meters	\$331	1,504	1,579	1,658	1,741	1,828	1,920	2,016	2,116	
main & service construction - 5 years	\$1,281,040									
gas O & M new main per year	\$8,080	36,667	38,500	40,425	42,446	44,569	46,797	49,137	51,594	
existing main/service repairs per year	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 6 meters	\$994	4,512	4,738	4,975	5,224	5,485	5,759	6,047	6,349	
main & service construction - 5 years	\$358,215									
gas O & M new main per year	\$3,281	14,890	15,635	16,417	17,237	18,099	19,004	19,954	20,952	
existing main/service repairs per year	\$15,967									
Camp Evans facility										
annual meter charge for 4 meters	\$663	3,008	3,159	3,317	3,482	3,656	3,839	4,031	4,233	
main & service construction - 5 years	\$111,362									
gas O & M new main per year	\$629	2,854	2,997	3,147	3,304	3,470	3,643	3,825	4,017	
existing main/service repairs per year	\$5,179									
B. NET PRESENT VALUE		\$2,024,382	3,305	3,155	3,011	2,874	2,744	2,619	2,500	2,386

Alternative by facility and function	year no of years	2031	2032	2033	2034	2035	2036	2037	2038	
		39	40	41	42	43	44	45	46	
A. 100% NJNG Ownership 12 miles of 60										
Main Base facility										
annual meter charge for 262 meters	\$43,419	291,111	305,667	320,950	336,998	353,847	371,540	390,117	409,623	
existing main & service repairs per yr	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 148+60 meters	\$34,470	231,111	242,667	254,800	267,540	280,917	294,963	309,711	325,197	
existing main & service repairs per yr	\$15,967									
Camp Evans facility										
annual meter charge for 54 meters	\$8,949	60,000	63,000	66,150	69,458	72,930	76,577	80,406	84,426	
existing main & service repairs per yr	\$5,179									
A. NET PRESENT VALUE		\$1,777,732	14,151	13,507	12,893	12,307	11,748	11,214	10,704	10,218
B. 100% Fort Monmouth Ownership 15 miles of 5										
Main Base facility										
annual meter charge for 2 meters	\$331	2,222	2,333	2,450	2,573	2,701	2,836	2,978	3,127	
main & service construction - 5 years	\$1,281,040									
gas O & M new main per year	\$8,080	54,173	56,882	59,726	62,713	65,848	69,141	72,598	76,227	
existing main/service repairs per year	\$39,011									
Charles Wood facility (w/ Wherry House)										
annual meter charge for 6 meters	\$994	6,667	7,000	7,350	7,718	8,103	8,509	8,934	9,381	
main & service construction - 5 years	\$358,215									
gas O & M new main per year	\$3,281	22,000	23,100	24,255	25,468	26,741	28,078	29,482	30,956	
existing main/service repairs per year	\$15,967									
Camp Evans facility										
annual meter charge for 4 meters	\$663	4,444	4,667	4,900	5,145	5,402	5,672	5,956	6,254	
main & service construction - 5 years	\$111,362									
gas O & M new main per year	\$629	4,217	4,428	4,650	4,882	5,126	5,383	5,652	5,934	
existing main/service repairs per year	\$5,179									
B. NET PRESENT VALUE		\$2,024,382	2,278	2,174	2,076	1,981	1,891	1,805	1,723	1,645

Alternative by facility and function	year no of years	2039	2040	2041	2042
A. 100% NJNG Ownership 12 miles of 60					
Main Base facility					
annual meter charge for 262 meters	\$43,419	430,104	451,609	474,189	497,899
existing main & service repairs per yr	\$39,011				
Charles Wood facility (w/ Wherry House)					
annual meter charge for 148+60 meters	\$34,470	341,456	358,529	376,456	395,279
existing main & service repairs per yr	\$15,967				
Camp Evans facility					
annual meter charge for 54 meters	\$8,949	88,647	93,080	97,734	102,620
existing main & service repairs per yr	\$5,179				
=====					
A. NET PRESENT VALUE	\$1,777,732	9,753	9,310	8,887	8,483
B. 100% Fort Monmouth Ownership 15 miles of 5					
Main Base facility					
annual meter charge for 2 meters	\$331	3,283	3,447	3,620	3,801
main & service construction - 5 years	\$1,281,040				
gas O & M new main per year	\$8,080	80,039	84,041	88,243	92,655
existing main/service repairs per year	\$39,011				
Charles Wood facility (w/ Wherry House)					
annual meter charge for 6 meters	\$994	9,850	10,342	10,859	11,402
main & service construction - 5 years	\$358,215				
gas O & M new main per year	\$3,281	32,504	34,129	35,835	37,627
existing main/service repairs per year	\$15,967				
Camp Evans facility					
annual meter charge for 4 meters	\$663	6,566	6,895	7,240	7,602
main & service construction - 5 years	\$111,362				
gas O & M new main per year	\$629	6,231	6,543	6,870	7,213
existing main/service repairs per year	\$5,179				
=====					
B. NET PRESENT VALUE	\$2,024,382	1,570	1,499	1,431	1,366