WHAT IS CLAIMED IS:

1. A high efficiency low NO_x emission thermal oxidizer burner apparatus, which apparatus comprises:

a plenum chamber having an inlet for introduction of combustion air;

a combustion chamber in fluid communication with said plenum chamber;

at least one primary waste gas pipe passing through the plenum chamber terminating at the chamber for introduction of primary waste gas into said mix chamber; and

a primary fuel gas line through said plenum chamber for introduction of primary fuel gas into said combustion chamber, resulting in improved mixing of internal and external fluid streams.

2. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 1 including:

a secondary waste gas pipe in fluid communication with said combustion chamber for introduction of waste secondary gas into said combustion chamber.

3. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 1 including:

a secondary fuel gas line terminating at said combustion chamber for introduction of secondary fuel gas therein.

4. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 1 wherein said primary waste gas pipe terminates in a lobed tip nozzle.

5. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein said lobed tip nozzle includes a plurality of radially extending lobes symmetrically arranged around a center axis.

6. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein each of said plurality of radially extending lobes tapers from said primary waste gas pipe.

7. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 5 wherein the cross-sectional area of the nozzle remains the same throughout while the perimeter of the cross-sectional area increases.

8. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein said lobed tip nozzle having a plurality of radially extending lobes is centrally located in said plenum chamber.

9. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein said lobed tip nozzle having a plurality of radially extending lobes is centrally located in said plenum chamber.

10. A method of high efficiency thermal oxidation resulting in low NO_x emission, which method comprises:

introducing combustion air into a plenum chamber;

introducing primary waste gas through said plenum chamber through a lobed tip nozzle;

mixing said combustion air with said primary waste gas;

introducing primary fuel gas through said plenum chamber to mix said combustion air and said waste gas; and

combusting said fuel gas, said combustion air and said waste gas in a combustion chamber.

WHAT IS CLAIMED IS:

1. A high efficiency low NO_x emission thermal oxidizer burner apparatus, which apparatus comprises:

a plenum chamber having an inlet for introduction of combustion air;

a combustion chamber in fluid communication with said plenum chamber;

at least one primary waste gas pipe passing through the plenum chamber terminating at the chamber for introduction of primary waste gas into said mix chamber; and

a primary fuel gas line through said plenum chamber for introduction of primary fuel gas into said combustion chamber, resulting in improved mixing of internal and external fluid streams.

2. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 1 including:

a secondary waste gas pipe in fluid communication with said combustion chamber for introduction of waste secondary gas into said combustion chamber.

3. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 1 including:

a secondary fuel gas line terminating at said combustion chamber for introduction of secondary fuel gas therein.

4. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 1 wherein said primary waste gas pipe terminates in a lobed tip nozzle.

5. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein said lobed tip nozzle includes a plurality of radially extending lobes symmetrically arranged around a center axis.

6. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein each of said plurality of radially extending lobes tapers from said primary waste gas pipe.

7. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 5 wherein the cross-sectional area of the nozzle remains approximately the same throughout while the perimeter of the cross-sectional area increases.

8. A high efficiency low NO_x emission thermal oxidizer burner apparatus as set forth in Claim 4 including a plurality of lobed tip nozzles.

9. A high efficiency low N_{Ox} emission thermal oxidizer burner apparatus as set forth in Claim 4 wherein said lobed tip nozzle having a plurality of radially extending lobes is centrally located in said plenum chamber.

10. A method of high efficiency thermal oxidation resulting in low NO_x emission, which method comprises:

introducing combustion air into a plenum chamber;

introducing primary waste gas through said plenum chamber through a lobed tip nozzle;

mixing said combustion air with said primary waste gas;

introducing primary fuel gas through said plenum chamber to mix said combustion air and said waste gas; and

combusting said fuel gas, said combustion air and said waste gas in a combustion chamber.