HEADQUARTERS
UNITED STATES MILITARY ASSISTANCE COMMAND, VIETNAM
APO SAN FRANCISCO 96222

MACEVAL

5 April 1968

MEMORANDUM FOR: COMUSMACV

SUBJECT: An Analysis of the Khe Sanh Battle

1.   This paper presents an analysis of the effect of friendly firepower on the enemy force positioned in the Khe Sanh area.   It was clear by mid-January 1968 that the enemy had concentrated two divisions plus their supporting forces in the vicinity of the allied positions at Khe Sanh.   Analysis of his intentions by the MACV Staff, plus intelligence accumulated from many sources, indicated conclusively that the enemy had planned a massive ground attack against the combat base supported by armor and artillery.   His initial target date apparently coincided with the TET offensive.   Subsequent target dates were:

   a. The last week in February.   This date would parallel the time schedule followed at Dien Bien Phu.   His heaviest attacks by fire at Khe Sanh did occur during the period 21 - 25 February.

   b.   13/14 March and 22/23 March.   These dates were obtained through intelligence sources.

It now appears that the enemy has abandoned his intentions at Khe Sanh, evidenced by the fact that one of the division forces has been redeployed out of the area and towards Hue.

2.   The question demanding an answer is "why?"

3.   A massive air campaign known as "Operation Niagara" was initiated in the Khe Sanh area on 15 January 1968.   The campaign ended on 31 March 1968.   This campaign represented the essential form of offensive power employed by the allied forces.   Ground combat action did occur - the battle at Lang Vei is an example.   And heavy ground delivered ordnance fires have been employed in the form of light and medium artillery and mortar fires from the Base and heavy artillery fires from Camp Carroll and the Rockpile.   But the preponderance of the allied effort was the air campaign waged by tactical and strategic air forces.   To illustrate, during the period of the Niagara operation:

MACEVAL
SUBJECT: An Analysis of the Khe Sanh Battle

5 April 1968

                    96,000 Tons of air ordnance were delivered
                  __3,600__ Tons of ground ordnance were delivered
                    99,600 TONS TOTAL

The air delivered firepower represented 96% of the total. What influence
did this air campaign have on the enemy's decision to abandon his attack
plans?

4. Needless to say, a precise measure of the effect of friendly fires on
enemy forces is impossible. Some battle results are available but these
represent only what has been seen by air observers or reported by pilots
during debrief. At TAB A is a summary of this bomb damage assessment.
It is fair to say that this data by itself is not conclusive. Further
analysis is required.

5. At TAB B is a graphic portrayal of the area around Khe Sanh.

     a. The limits of the Niagara Area of Operations are shown by the
grid. These limits specify the geographic boundary of the area in which
air ordnance was to be delivered, and was designed to include enemy troop
locations as well as lines of communication and logistics complexes.

     b. A second area of operations was specified by the ground commander.
This was known as "A.O. Scotland" and is depicted in yellow. It is within
these limits that the ground commander planned his troop movements and
controlled the delivery of fires,

     c. The area in red represents the geographic concentration of
strategic and tactical air delivered fires. While some tactical air
fires were delivered external to these limits, this geographic limitation
represents the preponderance of fire concentration. At TAB C is a
picture of the map overlays showing how these fires were concentrated.
The rectangular areas with the large circles represent strategic air
strikes. The small dots represent tactical air strikes. It is clear
that the preponderance of fires were concentrated in the areas represented
by the red plot at TAB B.

6. Several assumptions concerning the geographic distribution of enemy
forces and the casualty effects of fires must be made.

     a. The preponderance of enemy forces were located within the
geographical limits of this bomb pattern. The overlay at TAB D plots
the known location of enemy battalion size units with reference to this
bomb pattern. This area totals 564 Km^2.

     b. While not every small enemy unit within the heavy bomb concentra-
tion was attacked, an equivalent number in small units was attacked by
tactical air strikes outside the heavy concentration.

2

   c.   The vulnerability of enemy forces within this geographic pattern was similar to that of friendly forces at Khe Sanh.

   d.   There is a cause and effect relationship between volume of fires and troop dispositions on the one hand and KIA on the other, as represented by this formula.

$$KIA = K \times \frac{Nr\ Troops}{Km^2} \times Tons\ of\ ordnance \quad (see\ TAB\ E)$$

7.   In addition to the direct enemy kills, losses to the enemy force also accrued from wounded requiring evacuation.   To arrive at this figure, an analysis of US experience in personnel killed and personnel wounded requiring evacuation and hospitalization has been made.   From January 1966 to October 1967, for every US soldier killed, 3.44 additional soldiers were wounded severely enough to require hospitalization.

8.   In addition, an accounting must be made for enemy killed by ground action.   This totals approximately 2000 according to after action reports. Again accounting for wounded/evacuated, an additional 8880 casualties were inflicted by ground forces.   That this estimate of wounded/evacuated is valid is attested to by intelligence reports that state that 10% of every NVA unit in the area suffered from concussion type injuries of such severity to require evacuation.

9.   A number of different techniques have been considered in order to estimate enemy casualties.   Each of these techniques is explained in the following sub-paragraphs.

   a.   Analysis by cause and effect.   The formula for this analysis is discussed in detail in TAB E.   The data inputs to this formula are summarized here.

   Friendly positions

      Area   - 4.8 Km^2

      Enemy delivered fires - 99.25 tons (Khe Sanh experience)

      Friendly forces   - 6085

   Enemy positions

      Area   - 564 Km^2

      Friendly delivered fires - 99,600 tons (TAB F)

      Enemy forces 15 Jan 68 - 20,000
                         31 Mar 68 - 9,100
                         Average   - 15,100 (TAB G)

The application of this logic, including casualties inflicted by ground action, yields an estimated 15,760 casualties (3550 KIA + 12,210 wounded and evacuated) from delivered fires plus 8880 casualties (2000 KIA + 6880) from ground action, for a total of 24,640.

    b. Estimate based on KBA.

A low side estimate of enemy losses can be computed from the observed KBA figure in TAB A. 1288 bodies plus wounded and evacuated of 4430 yields a minumum personnel loss of 5718 from air operations, plus 8880 from ground action, for a total of 14,600.

    c. Estimate based on bomb damage assessment.

A third estimate of enemy casualties can be made by assignment of reasonable personnel losses to the bomb damage assessment at TAB A. A number of KIA has been assigned for each type of bomb damage. Only destroyed facilities were included; damaged facilities were not credited with any KIA. The table at TAB H summarizes such an analysis. Again applying the wounded and evacuated factor, a total of 20,050 casualties were suffered by the enemy as a result of delivered fires plus 8880 in ground contact, or a total of approximately 28,900.

    d. The following table summarizes these findings in order of the magnitude of the estimate.

METHOD OF ANALYSIS	KIA	EVAC	TOTAL (ROUNDED)
KBA	3288	11,310	14,600
Cause and Effect	5550	19,090	24,600
BDA	6515	22,410	28,900

10. The magnitude of these losses may appear unreasonable in view of the enemy's average strength of 15,100. However, the evidence suggests that the enemy was able partially to replace his losses. His strength was 20,000 on 15 January and was reduced to 15,200 by 31 March, 6100 of whom were redeployed out of the immediate Khe Sanh area. Therefore his net loss was only 4800, and the total numbers of enemy personnel entering the Khe Sanh area varies between 29,700 on the low side and 44,000 on the high side. This would require a daily replacement rate of between 190 and 380 troops. Because of the importance of the target and the proximity of sanctuaries, these replacement rates are considered reasonable.

SECRET

MACEVAL
SUBJECT: An Analysis of the Khe Sanh Battle

11.   Therefore it is concluded that:

    a.   Losses inflicted on the enemy force varied between 49% and 65% of the personnel committed to the Khe Sanh Operation, including replacements.

    b.   These losses forced the enemy to abandon his plan for a massive ground attack.

    c.   The magnitude of these losses indicates the enemy forces at Khe Sanh suffered their major defeat of the war.

DONALD A. GRUENTHER
COL, USA
Director

5

CUMULATIVE BOMB DAMAGE ASSESSMENT – OPERATION NIAGARA

	7AF	B-52	NAVY/MARINE	TOTAL
SECONDARY EXPL	2215	1362	1128	4705
SECONDARY FIRES	1173	108	651	1932
KBA	650	--	638	1288
TRUCKS (DEST/DAM)	204/37	--	49/15	253/52
GUN PSNS (DEST/DAM)	135/18	--	165/25	300/43
BUNKERS (DEST/DAM)	216/19	--	675/80	891/99
STRUCTURES (DEST/DAM)	564/52	--	497/106	1061/158
TANKS (DEST/DAM)	4/0	--	5/4	9/4