BLACK MESA: *SOURCE*

GENERAL DESIGN DOCUMENT

A HALF-LIFE 2 MODIFICATION

This is the public version of the Design Document which means that many technical descriptions and other such team-critical information is withheld, primarily because many people do not want to trouble themselves with the specifics, as well as we want to keep something a surprise! Please feel free to comment on this document as you feel the need, but follow that this is Black Mesa: Source property: any attempted redistribution outside of the Black Mesa: Source release is working against our intellectual property and we ask that you refrain from doing so.

http://www.blackmesasource.com

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BLACK MESA: SOURCE
A LeakFree Source Engine Development Community Project

Design Document:

This *General Design Document* is intended to supply information about our plans in terms of development, design, conceptualization as well as other information that may or may not be used in the final version of the game. Contained within this document will be information on:

- General Ideas and Concepts for the Half-Life 1 Plot & Storyline,
- Single-Player & Multi-Player design aspects,
- Weapons,
- Monster Information,
- Physics Engine Uses,
- NPC interacts,
- Speech, sounds and Music Track,
- Textures and other Graphical improvements,
- Models for physics objects and other interactable objects,
- Information and present goals for the Team,
- Information on web development,
- Web Development Information,
- General input and;
- Other community submitted ideas that may or may not be used in the final cut.

Introduction:

Black Mesa: Source is a fully pledged modification founded by the LeakFree Source Engine Development Community. Those involved with the project want to make the Black Mesa Research Facility a place to be known far and wide as Gordon's fruitful beginning and what better way to demonstrate that love, but to recreate the game that formed one of the largest gaming communities in the world.

Black Mesa: Source is a Half-Life 2 modification determined to recreate Half-Life 1 on the Source Engine from the ground up, keeping the original as much intact as it possibly can meaning plotlines, concepts, ideas, level layouts, characters, weapons and monsters will be left the same, except with MASSIVE graphical improvements. We intend to increase polycounts on monsters, weapons, NPCs, weapons and more and put forth the Black Mesa Research Facility the way it was meant to be seen and to give players the chance to fight the battle the way it was meant to be fought. Chapters and the Facility itself will be rebuilt from the ground up with care taken to keep most of the areas the same, but with major improvements in design, architecture, and more.

We are a team of gamers and fans of the original game all wanting it to be as best as it can be. If you feel you have the dedication and talent to help out with this modification, drop a line in these forums with some previous work. If you have any ideas, suggestions, comments or more feel free to also drop us a line. Everything is well accepted. We hope it to be a very successful project as well as a learning experience for all involved. We want to give Gordon Freeman's past a new face and we feel that by re-doing this game on a brand new engine our goals will be fully accomplished. Of course there is a belief that Valve Software is re-doing the game themselves, but we generally feel that their work is more of a 'port' then a reconstruction of the game.

Goals:

Black Mesa: Source's primary goal is to recreate the experience which drove so many crazy for the game. The game, simply, is incomparable to any other in its genre or time: and it will remain such until the day the earth ends and the combine really do invade our planet. We plan to do this by increasing the polycounts on the models such as the scientists, Barney's, and the soldiers. We plan to create at least a dozen variations of the scientists, security guards and the US Marines in order to create the experience that something more then a large group of 'clones' were at the Black Mesa Research Facility.

The level geometry and layout including the objectives and the routes to these objectives will be as left intact as to the best of our abilities as level design will play a large role in development. In terms of level design we want to add-on small rooms, filling up large blank areas (making the world more realistic and dynamic) as well as add pipes and other "fillers" creating a better sense of the facility. Level design will be enhanced further with new sound effects (based upon their original counter-parts) and new "baked" and bump-mapped texture styles, which are fully based upon their original counter-parts. In all we are not trying to change the original Half-Life, simply enhance this and we fully understand that there is a fine line between those different sides which we are more then surely going to be bouncing back and forth between during our development. We only hope that the community will support us through this endeavourer.

As a final goal, the Black Mesa: Source modification team wants to improve their own development techniques as well as personal skills with the Source engine and its toolset. This is primarily for personal experience, but also allows for a part of the development team to be absent from development for a week and still allow the team to continue on with development. This requires that all team members will teach each other and touch up upon their respective and relevant areas and learn the basics about them.

Project Plan:

The **timescale** of Black Mesa: Source is expected to run for at minimum one year and at most is uncertain. The majority of time for this modification will be spent on the design and implementation of ideas because of not only the level of quality we as a development wish to achieve, but also the amount of content present in this modification. The **resources** of this modification will be the community input as well as the manpower of the development team. It is obviously the most important aspect of any modification. Finally the overall **budget** of this modification will be very low if none. Black Mesa: Source will be released as a 'free modification', and therefore all owners of Half-Life 2 will be able to download the game at no extra cost.

Analysis:

Half-Life: Source is Valve's ported version of the hit classic, Half-Life. Unfortunately they have been unable to upgrade all of the models, materials, sounds, levels, et cetera, to the Source engines new limits.

Black Mesa: Source is our own version of the game Half-Life on the Source Engine. It has been decided that the modification will be free and available to all owners of Half-Life 2 and Half-Life: Source. It has also been decided that Black Mesa: Source will release its content to the owners of Half-Life: Source. This will be an update on the models, sounds, and materials, but not level geometry. To which the Half-Life 2 modification (Black Mesa: Source) will receive the major enhancements on the level design.

Policy:

In general we'll be as open to the community as we possibly can because without them there would be no want or drive to complete the modification other then our own initiatives. As a modification team we must keep them "on the edge" as well as involved with the modifications development. All in all, they are important and most conceptual discussions will go through the community as well.

Disclaimers, Rights, Intellectual Property & Other Copyright Information.

- Half-Life: Source and all aspects of it including the story, the models, textures, levels, code, graphical interfaces, soundtrack, sounds, speech, audio, and all other features incorporated into Half-Life: Source are property (reproduction rights, intellectual property rights as well as ownership) of Valve Software.
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- Valve Software owns the rights to all Intellectual Property and Copyrights on Half-Life 1, Half-Life: Source, Half-Life 2, as well as any game in the Half-Life series. They withhold the right to contact us in terms of helping us out in any aspect of the development of Black Mesa: Source. They also withhold the right to cease development of Black Mesa: Source as they hold the rights to many aspects of the modification we are going to be creating.
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- All levels created and used in Half-Life 1, Half-Life: Source and Half-Life 2 are the property of Valve Software and their respective owners working at the company. All maps made for Black Mesa: Source are the property of their respective owners. They are based upon the originals made by Valve Software and are made solely for the use in the Half-Life 2 modification 'Black Mesa: Source'. No levels created by Valve Software will be used in the final cut of Black Mesa: Source, but rather our own designs of the original maps.
- In the event of a soundtrack, recompilation of speeches and/or sounds from Half-Life 1 (or Half-Life: Source) will be the property of Black Mesa: Source, given that they created then from scratch. These sounds may or may not be based upon the originals created by Valve Software. In the event of such basis on the original sounds, credits will be given to Valve Software.
- All entities, code, levels, textures, models, ideas, additions to the original game, graphic improvements, intellectual property and all other material created by the Black Mesa: Source team is their property and not that of Valve Software. Most of the material that will be created by the Black Mesa: Source team will be based upon the material and entities created by Valve Software.
- All entities, code, levels, textures, models, ideas, additions to the original game, graphic improvements, intellectual property and all other material created by Valve Software is their property and not that of Black Mesa: Source.
- The name 'Black Mesa: Source' is copyright to the Black Mesa: Source lead and not Valve Software.
- Word has been sent to Valve Software regarding our action plan and we eagerly await their response.

The Team:
Please note that this is subject to change without notice and the official listing will be displayed on our website once it is online.

Administration:
Jon 'Kalashnikov' Dominski :: *Project Founder, Co-Director* ::
James 'denzil' Headdon :: *Project Founder, Co-Director, Public Relations* ::

Game Mechanics:
'natedgreat3 :: *Animator*::

Level Development:
R. Michael 'Section_Ei8ht' Zurad
Juan José 'Mendasp' Alfaro
Ladislav 'Jackar' Jochman
Andreas 'Andreas' Stavaas
Robert 'Bob' Sikowski
Chris 'Kester' Harrison
James 'denzil' Headdon
Jon 'Kalashnikov' Dominski
'TailGunner'
'Zyndrome'

Art & Model's:
Chris 'Lupus' :: *Modeller* ::
Daniel 'NetWarriorDan' Escobedo :: *Modeller* ::
Robert 'Sanada' Chinner :: *Modeller* ::
Tyler 'Loki Seto' Montague :: *Modeller* ::
'GellyFish' :: *Modeller* ::
'Stimor' :: *Modeller* ::
Jeroen 'Geronimous' Hendrix :: *Texture/Conceptual Artist* ::
Brian 'bkd86' Dale :: *Conceptual Artist* ::
S. 'Ole' Bekkelund :: *Conceptual Artist* ::
D. 'd'keesto' Keese :: *Texture Artist* ::
'LimeyGeeza' :: *Texture Artist* ::
'Orcone' :: *Sprite & HUD Artist*::

Misc. Operations:
Section_Ei8ht - Web Development

Development Process:
Use Valve's Cabal process to cooperate thoughts and views on each section of the game. Personal development will be a large part of learning for each team member, grasping some new techniques or technologies to help their skills expand.

Team sets, there will be several smaller groups of developers, for example the mappers will be split up into Single Player (Black Mesa & Xen groups) and Multiplayer (Death Match) groups, they will cooperate ideas, plans and progress on a regular basis but work on separate projects. Giving unbiased views on the other groups work and play testing it where and when required. The tram journey will be fully overhauled graphics wise, and extended to show off the engine and complex a little more. There will still be the original key sections such as G-Man and the bounce level. The extension of entering the complex and some other areas will also be added.

Voice acting will not be needed until very late stages of the completed levels, although many personnel will be required in order to give each character a unique voice and personality. We intend to recreate the voice dialogue based upon situations, areas the player is in as well as the model that is associated with the voice.

Element Development:
Maps - Start four (minimum) mappers out on recreating the Half-Life levels, but with slight gutting to geometry where it can be replaced (for the better) with models and such. Subsequent versions of these maps will later be created to show off the HL2 engine and what HL could have been, but unlikely at first due to the story line being affected too much.

Models - Will be HL2 standard polygon count replicas of their HL counterparts, with better animations and facial expressions. Model baking will also be used to present low polygon models as being much higher.

Characters - Characters will be thought over more, each character will be have an individual look at them so as not to make clones.

Sounds - Higher quality replicas of the original HL sounds and music files will be created, where needed.

Materials - Replicas of the original HL textures will be created, using higher resolutions now capable in the HL2 Source engine. Again this will be done by modelling the texture, then rendering it for a higher quality look.

Scripts / Programming - At first the scripts will remain unchanged, but in future versions they may be modified slightly to allow for better game play experiences.

Shaders - New shading technology that has been introduced into the HL2 Source engine will be continued into this single player experience.

Artificial Intelligence - In later versions the HL2 AI will be integrated to see if the game experience can be improved in this department.

Story line - We are trying not to hurt the story line in anyway, as such, we will not be tainting it by adding, changing or removing key sections of the game.

**All of the below ideas, suggestions and comments are open for discussion
in their respective forum threads on the Black Mesa: Source forum.
Please comment on any aspect which you enjoy/dislike and tell us why.**

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SINGLE PLAYER DEVELOPMENT
(May include some aspects of the multi-player section of Black Mesa: Source)

Remember, "Because we can do this" doesn't mean we should, "Because we feel it would improve the game play experience" should be used in development.

Black Mesa: Source || DESIGN CONSIDERATIONS ||

- No cut scenes.
- Can't see legs or anything.
- Characters respond to you, make you feel like you are in a real life situation.
- Each level should have something important every 10 minutes.
- Each level should have something scary or intriguing to the player every 5 minutes, no matter how small.
- Not much information should be given away, in order to keep the player guessing as to what they will encounter.
- Moments of silence and darkness to make the player feel scared of being detected by the enemy.
- Lots of surprises and effects (foliage, flash light scanning, footsteps et cetera).
- Half-Life 2 style NPC Artificial Intelligence.
- Keep the game changing so that people have to work it out on their own, game walkthrough's are harder to write. – Needs reconsidering, if it was to change it wouldn't by much. Some enemy replacement or an extra one or two for example.
- Sounds like rain, footsteps, wind, breathing, pain must be very realistic.
- Effects like explosions, footsteps, terrain, fog, mist, darkness, sunlight, foliage, rain must be very realistic.
- Polygon hit detection not hit boxes
- Lighting with NPC's. Night-Watch has implemented a system where NPC's can distinguish (or can't being the case) a player in well lit surroundings, meaning stealth could be used as they cannot see well covered players
- Dynamic distance sound, volume and quality deepen as object moves closer
- Model LOD's (Level of Detail).
- Mapping wise, light switches and/or bulbs can be shot out to darken room.
- Realistic blood splatter.

Single Player:
The Half-Life single player mission will be rebuilt to a very recognisable replica to that of the original.

Black Mesa: Source || STORY & PLOTLINE ||

As this is a redo of the original, the story will be left intact as much as can be. Of course there will be the occasional addition, removal or representation of different ideas and situations, but those will happen based solely upon a majority of the team accepting the change as well as the limitations/new capabilities of the Source Engine. With such a new engine there will be the situations that can be created more logically and more realistically and the Black Mesa: Source team will take every chance to make the original game more realistic and more in-depth then the original. This is so that the Source Engine shows Gordon Freeman's past the way it was meant to be seen and fought.

With that said, below are the Chapters of the Original Half-Life game. As this design document becomes more public to the team, there will be those level designers that will want to map different chapters based on their own ability and desire for that chapter. As a message to the level designers, please choose chapters or parts that you can best represent and know very well. Replay the original game (that specific chapter) until you are able to really understand that level inside and out. Minor additions can be made to those levels, but do not upset the general feel, mood and layout of each level in the chapter. Any ideas from level designers or any team members in general can be posted on the forums provided for team discussion and those accepted by the majority of the team will be added to this design document. This is a recreation, and not a new creation:

Chapter 1 – *Black Mesa Inbound,*	Chapter 11 – *Questionable Ethics*
Chapter 2 – *Anomalous Materials*	Chapter 12 – *Surface Tension*
Chapter 3 – *Unforeseen Consequences*	Chapter 13 – *Forget About Freeman*
Chapter 4 – *Office Complex*	Chapter 14 – *Lambda Core*
Chapter 5 – *We've got Hostiles*	Chapter 15 – *Xen*
Chapter 6 – *Blast Pit*	Chapter 16 – *Gonarch's Lair*
Chapter 7 – *Power Up*	Chapter 17 – *Interloper*
Chapter 8 – *On A Rail*	Chapter 18 – *Nihilanth*
Chapter 9 – *Apprehension*	Extra: *Hazard Course*
Chapter 10 – *Residue Processing*	

Community submitted ideas:
- Include a scene of a very massive device that pulls objects towards it. This would be the 'alpha' of the gravity gun used in Half-Life 2. As far as we know now Eli distributed this device and also that Eli circulates Black Mesa technology to rebels.
- Eli should make a reference to Gordon about Alyx, perhaps to the point where 'it's her birthday, but the administrator forced me to come out here and oversee this experiment, I don't see why: it's just another standard anti-mass test'.

Black Mesa: Source || MONSTERS, ENEMIES, FRIENDIES & NPCs ||

Again the monsters will be left mainly the same, with a few more improvements to give them a more realistic stance as well as better incorporation into the game and experience. So all ideas sprouted by the community that have been accepted by the BM: S Team and even ideas sprouted by the BM: S Team. If you have any ideas to add, please post them in the Black Mesa: Source Forum:

- **Barney** – The possibility to use other weapons rather then simply a pistol would probably give this man the chance to actually 'survive' the incident rather then be pushed into battle by Gordon Freeman. He had his own spin off, go give the man a better gun!

- **Scientist** – Several variations of this model will be created in order to create more diversity in the scientists and the employees at the Black Mesa Research Facility. The possibility of having these have more animations for weapons and other actions is still up in discussion, but will be decided upon completely as the time comes.

- **G-Man** – Would use the model present in Half-Life 2 since it appears to be the best one to use, given the circumstances and abilities of the new model. He was only seen in the odd places and would then disappear so in terms of changes, there should be very little to none. He is perfect.

- **Alien Slave** - The first wave of fighters and usually hiding separately from the rest of the slaves, much like Guerilla Warfare. They still have their normal attacks and follow tactics when an alien grunt is nearby. They still have the controller collars around their hands and necks and will strike together rather then run around in single file to their death.

    Further Input:

Inherits off combine soldiers or whatever is closest. Equal moral whether alone or in groups. Have instincts of some tactical manoeuvre in groups, such as pincer attacks (defined more by mapper's placements of spawning than anything else). Will defend other slaves or higher classed aliens when they are being attacked, but will not tend to defend lower classed aliens so much if there is an opportunity to kill someone (AI Method notes - send out distress signals with various social levels encoded?)
Will lock individually onto a target, and tend to go after that pray unless a significantly more beneficial one comes along (i.e. one with a significantly larger threat)

- **Head Crab** - Would come out in groups of five or six rather then one by one. They would travel in swarms and generally would help hold someone down while one single head crab took control. Animations would be created so a live individual would be taken control of (from human to zombie) and would in turn help the head crabs.

    Further Input:

"Lone wolves": maybe they will even attack each other along with other aliens if it gives them an advantage to get a human. They would, after all, be attacking them in the home world possibly. Once they have taken down a pray, and the danger is low enough, they will crawl to the nearest available host and start to "take over" them (i.e. sit on their head and some idle animation will play). While doing this, their attention to sound and visuals is significantly reduced, giving the player a chance to sneak up on it.

- **Zombies -** Smarter AI could be helpful, but seeing as they are slow and generally non-lethal, their attacks should also be upgraded. A plan to give them a new attack which could allow them to be more fearful and devastating would be perfect and will be discussed further in the team forums.

    Further Input:

Generally see what the AI for the zombies are like normally for HL2. We should be able to get away with using that largely unmodified. But here are my ideas: Again, lone wolves. But won't attack others or other aliens, or just not as much. The odd jab at each other here and there. Has more than 2 attacks, i.e. can swing at different heights at different speeds.

- **Alien Grunt** - Would be more like a commander of the Alien Slaves rather then a fighter along with them. Of course they would attack Gordon, but overall they would be at a further distance to give it a better role as a commander: sending in his troops before himself. The view is still the same, with the armour rather then control collars.

- **Barnacle -** The new and quite general idea behind the Barnacle is that its tongue is not as visible as it once was. It is now more translucent as well as transparent, making it more difficult to see. It would also be present in dark areas only, giving more camouflage to its being.

- **Alien Controller** - This is much like a religious leader of the Xenians with its large cranium and its 'praying' attack as its hands come together and then fires balls of energy at you. The small cloak around its waist further symbolizes its religious past, so it would be correct to assume that it was a religious figure. The energy attacks and its movements will be kept intact.

- **Big Momma (Gonarch)** – Professionally it would be a great to see the movements of Big Momma to be more in tune with the environment. The pounds of the feet aligning with the animations as well as perhaps interactions with the environment. Attacks would be left the same, but its "home" would go through a massive renovation.

- **Bull Squid** – These spitting guys are much like they were in Half-Life 1: spit at you from a distance and perform a melee attack if you get too close. All things considered this is one of those fundamental enemies that need not be changed, but rather visually and mechanically improved. Mechanics refers to animations and code, et cetera.

Further Input:
They hang around in medium sized groups and fling snot at you. They don't tend to use cover well, as they are too slow to move back and forth, and their straight projectiles mean it wouldn't really work. Instead they fling a couple of snotballs at you, waddle a bit to a different area if you shooting at them, and repeat.

- **Apache** - Using the new apache from Half-Life 2 has been said to be the best choice of action, given that it is present in Half-Life 2 with new AI code and so forth. It also seems to behave roughly the same way as it did in Half-Life 1, which is how we need it to be.

- **Gargantua** - This amazingly ferocious enemy was really a highlight of the Xen invasion army as it was impenetrable by any firearm exclude explosives (or as it was in Sven Co-operative). Again, this enemy was only destroyable after you engaged the power or had him bombed in his second appearance. His invincibility will remain as it was.

- **Hound eye** - While these enemies were originally supposed to be allies, Valve saw the 'shoot first ask questions later' approach its beta testers took to them and just decided to make them enemies. They will operate better in groups and perhaps have a new attack when at close range, but they will still act cowardly and generally run away from the player.

Further Input:
Work in groups, seem like scavengers to me, so maybe they should be placed around dead bodies.
Frightened a lot of the time. Alone, they will tend to run away a lot, and in large groups with other aliens will stay at the back. Only tend to attack if you get too close. If they are interrupted halfway through charging (either to run away, or if the player gets really close) it produces a small static style discharge that creates sparks around it and a small amount of damage at very close proximity.

- **Human Assassin** - There was rumours that there was a model of the assassin in Half-Life 2 (leaked), but this will not be used in any way. Our models will be based upon the original model as was seen in Half-Life 1, but just as deadly (and 10x as sexy…).

Further Input:

Holy crap, however am I going to do this? I think there is a lot I can steal from HL2, but the originals were hailed as AI masterpieces. Just have to port as much of that as possible, while incorporating in the new HL2 advances. I don't think they include many/any hand gestures in HL. I'll probably be including hand signals so they appear to be working as a proper team. I think also visible night vision etc. for them as well.

- **Osprey** - This model will be based more upon real-time shots from both Half-Life and the osprey images that have been collected over the course of our conceptualization stages. Marines will still fall from the osprey and it will still hover in circles, but perhaps it can be modified in such a way that grunts can shoot at you from the air.

- **Nihilanth** - Enemy at the end of Half-Life 1. Simple and straightforward he is a very fundamental piece of the puzzle Gordon is trying to solve and with changes to Nihilanth, it may disrupt the sequence or story. He should not be changed.

- **Miniturret** - See 'Turret'.

- **Sentry** - Smarter, deadlier and faster: these sentries will really be gunning for you this time. Generally the same design, but perhaps you will be able to see some of the grunts carrying them around and to setting them up around sometimes. Perhaps even having crates full of them.

- **Trip mine** – Such a simple enemy (and weapon) that it's code is similar to the laser trip beams you see in Half-Life 2. If tripped, do this. This is just detonating so this enemy is very straight forward.

- **Turret** – The turret is a very simple and straightforward enemy. It detects you, it comes out, and shoots you. AI such as this is very simple and the design should be a very futuristic while cold-war era feel to it: allowing the superior fire-power of today with the aged look of the past.

- **Human Grunt -** Would have night vision that worked. For example if the grunts cut the lights to a room, a pulsing green light (small) would be seen by Gordon as the grunts moved about the room. They would also have multiple weapons to use including shotgun, assault rifle, and 9mm sidearm.

Further Input (Black Op):
The first area to look at is how they fight. Never in real life would a solider fire from an open position when there's plenty of cover to go around. When fighting, a grunt should always fire from a nearby source of cover (like sandbags), and conceal themselves when they get hit instead of shooting till death. While one or more grunts are firing at you, another could find a flanking position where they could fire at you from. This should go quiet a bit of ways in making them more deadly.

By using their other weapons better, it could also go a long ways, like throwing their grenades better. Grunts should never throw their grenades at a moving target, only on those who are stationary and hiding somewhere. And have them to hold on a grenade for a couple seconds after pulling the pin, then throw it so it explodes once it reaches you instead of giving you time to flee. And suppose you do catch them in a open position. They should fire a rifle grenade at you while they find better places to shoot you from. And if you rush a Marine and he's caught reloading, that Marine should drop his current weapon and resort to a Desert Eagle or a knife (all from Op4, but it can be made so you can't use them upon grunt death). While the player during install has to choose between using a MP5 or a M4, I think the grunts with the autos can be randomly assigned one or the other. However, the only difference between them is how they look and sound, and even if you come across the gun you didn't pick, you could only get ammo for the gun you selected. Also there could be Marines that use a SAW or Sniper Rifle in certain portions to make them harder, but to maintain purism these weapons can't be picked up.

Next comes variation. By making use of and improving the models from the original HL, Op4, the HD pack, and PS2 version, one has access to quite a bit of variation. There's the gasmask and ski mask grunts. Also there's commanders that wear either red, black, or green berets as well as only a helmet. From Op4

comes the "Tower" grunts that wear those special hats. Finally there's those who have no headgear and are smoking. And don't forget about the engineers and medics. To end this post, I'll bring up reinforcements. I don't think in real-life, a Marine commander would just leave a group of Marines to die without sending them backup. Therefore if you leave a grunt commander alive for 30 seconds during a fight, he'll be able to summon more troops to your area. Either this squad can be spawned from an accessible area where "stationary" grunts are located, or if that's not possible they enter via a blocked passageway opened by an Engineer (of course with either a blowtorch or just plain explosives). This backup squad should number between 6-8 men.

- **Leech –** Small and quite insignificant, but then again it showed that the massive facility really did have its flaws. These little guys walk around and make a noise when you step on them: simple, done.

- **Snarks –** These little guys will be left as much the same as possible, they were just perfect in the original, so there is no need for change.

Further Input:
Bouncy buggers! Generally just copy HL AI for these. There's no intelligence, there suicidal bastards who run at you while jumping all over the walls and eventually blow up. (This comment courtesy of our own [ICR]).

- **Mini-head crab –** These little buggers come out of the Big Mommas and are sometimes hard to see. The AI here should be left as much intact as possible because it was simply as easy as the Snarks: go to player and kill. With that said these monsters will most likely be left as close to the original as possible.

- **Ichthyosaur –** There is an Ichthyosaur in Half-Life 2, but the call is up to the modellers ability in order to recreate the large underwater Xenain. We'll be looking more into the operations and animations of this new model and make a judgement call after that.

- **Tentacle –** I have been told that this enemy is also present in Half-Life 2 and depending upon the similarities between its Half-Life 1 counter-parts, may be used in Black Mesa: Source. I think we will need to recreate the model, but overall it will most likely be close to its new Half-Life 2 look.

- **Roaches –** This little creature went 'splat' when you stepped on it, and it should be kept simply because of its simplicity and lovability (personally, I love to step on the little guys). Other ideas include adding mice and other small rodents to the facility in order to give it a more unique feel.

Black Mesa: Source || ARTIFICIAL INTELLIGENCE ||

Breakdown:

One of the key factors in Black Mesa: Source is the artificial intelligence which will drive the enemies fighting to kill Gordon. With such want to create a real and immerse environment comes the want to create an AI which will function properly in order to make it flow even more smoothly. We feel that the AI driving the marines will be most important as they will be one of the main enemies throughout Black Mesa: Source. As seen in the 'Monsters' portion of this design document is 'Further Notes' which refers to an AI breakdown of where we want to aim for their respective artificial intelligence.

Black Mesa: Source   **Public General Design Document**
A Half-Life 2 Modification   **Irrelevant Developments & LeakFree.org**

15

Black Mesa: Source || WEAPONS & ITEMS ||

Weapons:
The weapons will remain primarily the same, again with small modifications to adapt to the new engine and its new capabilities. A new Melee system has been suggested to be much like that seen in Opposing Force expansion pack where the melee attack can be as a 'power-up' strike. Again this is an idea that is still up for discussion and may or may not make it into the final cut of the game. As a general and board plan the weapons of Opposing Force will not be included. I stand quite strongly by this for several reasons the main one being that this is a re-make of Half-Life 1, those weapons were not in Half-Life 1, and so they shouldn't really be in Black Mesa: Source. Of course, the final verdict is up to the team in general.

Also all weapon models their corresponding models and their respective animations will also be redone with great care taken to ensure they are more graphically smooth to the eye, as well as overall improved from its original version.

- **Crowbar** – The addition of a new 'power-up' system has been suggested and it seems like a very reasonable and quite honest idea. It was really a good melee system for Opposing Force, especially with the first parts of the expansion pack where it was almost all you had. It will be considered in the final cut of the game whether or not to include this new system.

- **9mm Pistol** – the pistol, (and more often then none) the basic weapon of Half-Life will be left as close to the original as possible. This includes bullet strength, stopping power, clip size, bullet compatibility with the assault rifle, and all other aspects of it.

- **.357 Magnum** – The strongest pistol in the game (and the second pistol…) is again a controversial issue because of its scope. There were those modifications that refused to add the scope and those that accepted the scope, but I am not entirely sure whether or not it was included in the final cut for Half-Life 1. However it was in Half-Life 1 it will be carried over in Black Mesa: Source.

- **9mm Assault Rifle & Grenade Launcher** – This weapon will be modeled and based upon the original MP-5 looking weapon rather then the more m4a1 style that was seen in the High Definition Pack. Personally I think more Half-Life fans would be better impressed if we recreated the original weapon rather then the high definition rifle.

- **Spas-12 Shotgun** – The shotgun present in Half-Life 2 is much like the shotgun that is present in Half-Life 1, which in turn will be in Black Mesa: Source. All in all, this weapon will be much like the original Half-Life shotgun, except with a major make-over in terms of looks and details. The community will be active in discussion of this choice as many players have different takes on how the shotgun looked / should have looked.

- **Crossbow** – Sparks have been flying in the active discussion of this weapon and again, it is still sparking talks. As it was an original Half-Life weapon (and overall the only long-range weapon with a scope in the game) it should be left in. The way the weapon handles as well as the power/effect of its bolts have been questioned, but generally the weapon will be left as much the same as possible.

- **Grenades** – Like the Half-Life 1 model and not the 'pop-can' of Half-Life 2, the grenade will push the Physics around the most (apart from the rocket-launcher) so it will need to be designed correctly. Overall the logic behind this weapon is that it can be picked up after it has been tossed by another person, but this will require more code to do so (and the grenades will need to be correctly timed).

- **Satchel Charges** – Much like their Half-Life 1 counter-part, the satchel charges will remain generally the same expect with a higher level of detail and more animations. Its damage will be left intact, but we'll see how much the community looks into this.

- **Rocket Launcher** – Half-life 1 version and not the Half-Life 2. Generally they react the same, but all in all they are quite different. Half-Life 2 rockets seem to travel faster (larger environment) as well as they seem to pack more power. This will need to be investigated further.

- **Snarks** – Generally these little guys will be kept the same as their monster counter-parts, allowing for a real sense of the original which made them fall in love with the player so very much.

- **Tau Cannon** – The version seen in Half-Life 2 has undergone many years of development allowing it to become far more advance (and perhaps even powerful) then its Half-Life 1 counter-part and therefore we will be relying upon the weapons damage and look as it was in the original game.

- **Gluon Energy Weapon** – The shaking of the screen when using this weapon really made it seem powerful, so that aspect of the weapon should be left intact, all other aspects of the weapon are up for consideration.

- **Trip Mine** – This weapon will be kept the same. It was perfectly fine in the original and without and major kind of property changes, it'll be as great as it ever was.

- **Sniper Rifle** – This weapon has the possibility of being in the game. It is more then reasonable, but will be needed to be put up into active discussion before a final approval of denial can be called.

- **Pipe Wrench** – Overall the crowbar will be a fair enough melee weapon for the game the pipe wrench won't be needed in the final cut of the game.

- **Displacement Rifle** – This weapon was found in an area of Black Mesa where Gordon didn't visit so naturally the weapon shouldn't appear in Gordon's tale.

- **Desert Eagle** – This weapon has the possibility of being included because naturally if we add such weapons to the Marines to increase the reality as well as the difficulty, they should drop their weapon when they die.

- **Barnacle Gun** – This weapon was found in an area of Black Mesa where Gordon didn't visit so naturally the weapon shouldn't appear in Gordon's tale.

- **Combat Knife** – No need for this weapon in the final cut of the game. This was a personal weapon for the Marines so all in all Gordon shouldn't have it.

Items:
As most are aware, some of these items were not included in the final cut of Half-Life 1 (air tank and the antidote were not officially used), but we as a modification team plan to recreate their models regardless of the fact because they may be used somehow. These models will range in polygon counts from 200 for the battery up until roughly 1000 for the HEV Suit.

- **Air Tank,**
- **Antidote,**
- **Battery,**
- **Medi-Pack,**
- **Long Jump Module,**
- **HEV Suit,**
- **Multiplayer Drop Box, and:**

- **Ammo Models (clips, boxes of shells, etc).**

Level Specific Models:

These will be quite dynamic as you use them as you would not simply "absorb" health through the air from one of these machines. Overall these will change in some way when they are being used. Present ideas are to have a needle come out from the Health Charger (much like the charger in the Half-Life game for the PlayStation 2). Retina scanners will be more dynamic, unlike their six year old counterparts.

- **Retina Scanners,**
- **Health Charger,**
- **HEV Charger (Both types), and;**
- **Gun Turret (Usable).**

Vehicles:

Plans are to implement these vehicles as their own separate entities, capable of working on their own (following paths) depending upon different conditions. The only vehicles presently planned as being drivable are the Tram and Old train. This list may be expanded as development continues.

- **Apache**
- **APC**
- **Jeep**
- **Tram**
- **Flatbed train**
- **Forklift**
- **4-legged transport robot**
- **Old train**
- **Attack helicopter**

Black Mesa: Source || LEVEL DESIGN ||

- Level sizes should be increased with the source engine's new abilities,
- Incorporate physics operations into interactions with the environments,
- Incorporate radical improvements in architecture which means keeping the layout generally the same with some improvements with respective to sights, etc,
- Level loading spots should be left the same with the possibility of merging area and objective specific locations together to avoid mistakes in level transitions (an example of this would be 'Blast Pit' where you need to activate several different switches in three different levels and;
- Decompile old levels for specific measurements, but do all maps from scratch in order to increase originality as well as the fact that the original maps are property of Valve Software.
- Include 'alpha' stage of the gravity gun in one of the rooms that is locked. This would be a very large machine and you could see a box slowly being pulled.
- Ventilation shafts, walkways, railings and other common geometric pieces of levels will be created by one individual and they will serve as a 'common feature in development'.

These were the ideas set forth by the community as well as some of our own team members for level design. The idea is that the levels and layout of each level will remain the same, but with our own respective additions in order to make them more realistic as well as more 'player friendly' in terms of navigation (but no more then the original game allowed) and more expansiveness which will give the player a better sense of the massiveness of this facility they're stuck in. In other words, the levels will stay pretty much the same with minor changes with respect to our own modifications as well as the abilities of the Source engine.

Levels:
c0a0 ; c0a0a ; c0a0b ; c0a0c ; c0a0d, c0a0e ; c1a0 ; c1a0a ; c1a0b ; c1a0c, c1a0d ; c1a0e ; c1a1 ; c1a1a ; c1a1b, c1a1c ; c1a1d ; c1a1f ; c1a2 ; c1a2a, c1a2b ; c1a2c ; c1a2d ; c1a3 ; c1a3a, c1a3b ; c1a3c ; c1a3d ; c1a4 ; c1a4b, c1a4d ; c1a4e ; c1a4f ; c1a4g ; c1a4i, c1a4j ; c1a4k ; c2a1 ; c2a1a ; c2a1b, c2a2 ; c2a2a ; c2a2b1 ; c2a2b2 ; c2a2c, c2a2d ; c2a2e ; c2a2f ; c2a2g ; c2a2h, c2a3 ; c2a3a ; c2a3b ; c2a3c ; c2a3d, c2a3e ; c2a4 ; c2a4a ; c2a4b ; c2a4c, c2a4d ; c2a4e ; c2a4f ; c2a4g ; c2a5, c2a5a ; c2a5b ; c2a5c ; c2a5d ; c2a5e, c2a5f ; c2a5g ; c2a5w ; c2a5x ; c3a1, c3a1a ; c3a1b ; c3a2 ; c3a2a ; c3a2b, c3a2c ; c3a2d ; c3a2e ; c3a2f ; c4a1, c4a1a ; c4a1b ; c4a1c ; c4a1d ; c4a1e, c4a1f ; c4a2 ; c4a2a ; c4a2b ; c4a3, c5a1

Hazard Course:
t0a0; t0a0a; t0a0b; t0a0b1, t0a0b2; t0a0c; t0a0d

Chapter 1 – *Black Mesa Inbound*
This section is the tram ride that starts the game. You travel around the facility in the tramcar passing by working droids and those four-legged walkers that lift boxes, etc. You see areas of the facility, travel up and down, go into open sunlight to see a helicopter going to take off, ground crews, nuclear weapons, the whole nine yards. This will most likely be one of the most important sections of the modification because of its significance to not only Half-Life, but it serves as a first impression of what is to come. Remember also that this is the place where you travel past Barney Calhoun (had his own spin-off, Blue Shift) so it should be more reflective of how important and/or how close these two really are.

Level Developer(s): *Kalashnikov*

Chapter 2 – *Anomalous Materials*
The one most single important chapters of the game: regardless of how short it may be. This signifies the disaster as a whole and is almost like a climax to the entire game, given that after this is all you surviving and trying to escape. I would like to have our most experienced and professional level designer working on this level because of the anti-mass spectrometer part. I want it to really toss the player around and give them a sense of how powerful that machine really is. It should be large, menacing and most importantly look professional with lots of little parts. The rest of this chapter is you navigating the Sector C area (which you should possibly try to make seem bigger then what it appeared to be in the original. Perhaps add a door leading to another anti-mass spectrometer if you feel it could add that much, perhaps other doors

for other floors in the elevator (inaccessible, using un-breakable glass for windows). Again, take great care in the design and development of this level because seeing as it is the first chapter where the player has some kind of control: it will need to really impress them. Bob is setting out to give this area a real make-over in terms of design and representation. He will be adding more test rooms, more personnel as well as giving the player some more areas to explore before unleashing the world of Xen upon the world and thus sealing our fate. He hopes to take advantage of the new expansive features of Source and has laid out a single goal to accomplish over this level: *BLOW THE PLAYER AWAY.*

Level Developer(s): Bob

Chapter 3 – *Unforeseen Consequences*
Right after the incident, you're alive and that's what counts. If we can really shake up the player in the test chamber, maybe even have the first-person view slowly rocking back and forth, making the sounds in this section a bit distorted, and a small ringing in the ears after what has happened. The same kind of route to get out as it was in, and you meet Eli Vance as well. He tells you to get the surface and to possibly find 'Alyx' and his wife, giving that sense of panic for them as he must stay at his post. As before, he is really going to be giving more chances for the player to experiment and fool around, precluding to the sheer abilities of Source. Taking the same route out as the players took in, he hopes to give a real sense of how much damage the facility has under taken and sheer panic presently sweeping through the facility.

Level Developer(s): Bob

Chapter 4 – *Office Complex*
Level Developer(s): Jackar

Chapter 5 – *We've got Hostiles*
Level Developer(s): Kester

Chapter 6 – *Blast Pit*
Level Developer(s): *Tailgunner*

Chapter 7 – *Power Up*
Level Developer(s): *Mendasp*

Chapter 8 – *On A Rail*
Level Developer(s): *Mendasp*

Chapter 9 – *Apprehension*
Level Developer(s): *Mendasp*

Chapter 10 – *Residue Processing*
Level Developer(s): *Jackar*

Chapter 11 – *Questionable Ethics*
Level Developer(s): Section_Ei8ht

Chapter 12 – *Surface Tension*
Level Developer(s): Section_Ei8ht

Chapter 13 – *Forget About Freeman*
Level Developer(s): Kester

Chapter 14 – *Lambda Core*
Level Developer(s): Section_Ei8ht

Chapter 15 – *Xen*
Level Developer(s): *Kester*

Chapter 16 – *Gonarch's Lair*
Level Developer(s): *Kester*

Chapter 17 – *Interloper*
Level Developer(s): *Kester*

Chapter 18 – *Nihilanth*
Level Developer(s): *Kester*

Extra – *Hazard Course*
Level Developer(s): Kalashnikov

Black Mesa: Source   **Public General Design Document**
A Half-Life 2 Modification   **Irrelevant Developments & LeakFree.org**

21

Black Mesa: Source || MODELING ||

There is a large amount of modeling that needs to be done before Black Mesa: Source can 'hit the streets', so with that said below is a full listing of the models that will be needed in order to recreate our experience:

MONSTERS
- Barney
- Scientist
- G-Man
- Alien Slave
- Head Crab
- Zombie Scientist
- Zombie - Guard
- Alien Grunt
- Barnacle
- Alien Controller
- Big Momma
- Bull Squid
- Apache
- Gargantua
- Hound eye
- Human Assassin
- Osprey
- Nihilanth
- Miniturret
- Sentry
- Trip mine
- Turret
- Human Grunt
- Leech
- Mini-head crab
- Ichthyosaur
- Tentacle

WEAPONS
- Crowbar
- 9mm Pistol
- .357 Magnum
- 9mm Assault Rifle
- Spas-12 Shotgun
- Crossbow
- Grenades
- Satchel Charges
- Rocket Launcher
- Snarks
- Tau Cannon
- Gluon Gun
- Trip Mine

OTHER
- Scientist with Shotgun
- Physics Props
- Black Mesa Vehicles
- World Props & Models

These models will be as of highest quality as the modellers can produce for a modification. These numbers have the possible to change depending upon the level of quality that this medication plans to release to the public. Models will be HL2 standard polygon count replicas of their HL counterparts, with better animations and facial expressions. Model baking will also be used to present low polygon models as being much higher.

Black Mesa: Source || AUDIO & ENVIRONMENTAL VISUALS/EFFECTS ||

There are several aspects of audio development that will need to be done as development of Black Mesa: Source travels along, but some aspects such as voice actors and speeches will be handled after the majority of development has been completed. Below are files and sounds that need to be re-mastered before they are released with Black Mesa: Source:

Environmental Audio:
- Thunder
- Wind
- Rain
- Hale (Hail)
- Footsteps
- Ice
- Foliage
- Water Dripping
- Water Wading
- Sea
- Animals & Insects

Game play specific audio:
- Explosions
- Bullet Flyby
- Bullet Ricochets
- Weapon Fire (for each individual weapon)
- Character voices

Along with the audio of Black Mesa: Source, there are the accompanying visual effects to only seduce the player more into the game. Below is a listing of what visual effects will need to be accomplished (in full 3D):

Environmental Effects:
- Lightning
- Rain
- Hale
- Snow
- Ice
- Mist
- Fog
- Stars
- Space
- Sunbeams / Lens flare effect
- Water Reflection
- Wind
- Foliage
- Steam
- Smoke
- Fire
- Gas
- Grenade Output
- Night
- Terrain
- Sand
- Mud
- Swamp / Marsh
- Teleportation beams

Effects:
- Explosions
- Crashes (Vehicles)
- Bullet Entry (Water, Walls, Wood)
- Glass smashing
- Water Splashing
- Avalanches
- Footsteps
- Tracers
- Flashlight

BLACK MESA: *SOURCE*
GENERAL DESIGN DOCUMENT

MULTI-PLAYER DEVELOPMENT
(May include some aspects of the single player section of Black Mesa: Source)

Remember, "Because we can do this" doesn't mean we should, "Because we feel it would improve the game play experience" should be used in development.

Black Mesa: Source || GENERAL DEVELOPMENT ||

Single Player (Cooperation):

All sourced versions of re-created maps will be made available for cooperative game play. This meaning that through LAN or online hosted games, you will be able to play through the Half-Life single player mission with up to 32 players.

Multi Player (Game Modes):

At first the original Death Match and Team Death Match modes will be the only available modes, but later on several other modes may be included depending on demand and interest:

- Last Man Standing
- Last Team Standing
- Rally (Halo style)
- Team Death Match (Objective) – Teams battle to bring down a strider or something, whilst battling each other.

Black Mesa: Source || LEVEL DEVELOPMENT & DESIGN ||

Multi Player (Death match):

All official (original) death match maps will be made available in the first release of the modification. These include the following:

- Boot_camp
- Bounce
- Crossfire
- Datacore
- Frenzy
- Gasworks

- Lambda_bunker
- Rapid Core
- Snark_pit
- Stalkyard
- Subtransit
- Undertow

The above maps will also be recreated with 'Sourced' versions; these will be the higher quality versions with changes to some architecture and visuals. And some of the more popular and well known HLDM maps will also be recreated, such as:

- APOHLDM12
- APOHLDM13
- Apohldm8
- Boot_campx
- Cloisters
- Devious
- Doublecross
- Eliminator_jr
- Enders Game
- GMDM1
- Havoc
- Homeworld
- Jaw_breaker
- Lair
- Lost_village2
- No_remorse
- Outcry
- PC Gamer Infested
- Q3 ASSault

- Rats
- Rohan2
- Rustmill
- Sanitation
- Scary_1
- Scary_2
- Scary_2snr
- Stalkx
- Tension
- THDM1
- THDM2
- The_bone_collector
- Tig_qui
- Torment
- Turkeyburgers
- Valor
- Victory
- X-bounce
- X-bounce2
- Xfire2

Although these may not be made available at first release, several if not all will make appearances (hopefully, with the creators permission) with the modification. Opposing Force death match, team play and capture the flag maps will be included in later releases:

- op4_bootcamp
- op4_datacore
- op4_demise
- op4_disposal
- op4_gasworks
- op4_kbase
- op4_kndyone

- op4_meanie
- op4_outpost
- op4_park
- op4_repent
- op4_rubble
- op4_xendance

Again on later releases, some Half-Life 2 maps may be made available, but this is looking unlikely due to several modification teams already working on a Death Match mode for Half-Life 2's single player maps. But you never know.

Black Mesa: Source || MODELS & SPRAYS ||

Player Models:

All official (original) death match player models will be recreated, including some Opposing Force ones. At a later date some HL2 models may be made available to play with in DM mode, such as Alyx and D.O.G. These include the following:

- Barnet
- Beret
- Cl_suit
- Drill
- Female Assassin
- Gina
- G-Man
- Gordon
- Grunt
- Helmet

- HGrunt
- Male Assassin
- Otis
- Recon
- Recruit
- Robo
- Scientist
- Shepard
- Tower
- Zombie

Spray Paints :

All official (original) death match spray paints will be made available in the first release of the modification. These include the following:

- 8 Ball
- Andre
- Camper
- Chicken
- Devil
- Gun
- Lambda

- Skull & Crossbones
- Skull & Crossbones 2
- Smiley
- Splat
- Tiki
- V

Black Mesa: Source || WEAPONS ||

Multi Player (Weapons):

The multiplayer weapons of Black Mesa: Source will be those weapons of the single-player area of this modification, which includes:

- Crowbar
- 9mm Pistol
- .357 Magnum
- 9mm Assault Rifle & Grenade Launcher
- Spas-12 Shotgun
- CrossBow
- Fragmentation Grenades

- Satchel Charges
- Rocket Launcher
- Snarks
- Tau Cannon
- Gluon Energy Weapon
- HiveHand
- Gun Turrets

There will also be a server side option and mapper side options to customize the weapons used. This includes Half-Life, Half-Life 2 and Opposing Force weaponry. This option can be limited by the mapper so only 1 or 2 sets can be used for example. And also the server can choose if every map uses this weapon set, or the weapon set is chosen at random each map change.

There will also be an option for mapper's to randomly pick weapon placements, not geographically wise, but that the mapper will be able to select a priority weapon set for each weapon spawn. For example, the mapper could pick one weapon spawn to randomly select between the following weapons spawned there on map change:

1. Hive-hand
2. Shotgun
3. Magnum

This option will keep players on their toes and even game play more as there won't be as much camping in places. We will not changing game play at all, no adrenaline modifications, but we address issues such as bunny hopping in the future. Possibly a server side command will be created (e.g. Sv_bunnyhop 1) to allow servers to choose between allowing bunny hopping.

As previously mentioned, Opposing Force and Half-Life 2 weaponry will be allowed in DM mode, this includes the following:

- .357 Desert Eagle
- Barnacle Gun
- Displacer
- Knife
- M-249 SAW

- Shock Rifle
- Sniper Rifle
- Spore Launcher
- The Wrench

The Blue-Shift M4 will also be implemented, this would replace the Half-Life MP5, this will again be a server side option (e.g. sv_mp5m4 1).

- .357 Magnum
- Bug bait Pheromone (Could be adapted for new game mode)
- Crossbow
- Crowbar
- Fragmentation Grenade
- Gravity Gun (Perhaps)

- MP-7 / PDW
- Pistol (H&K USP Match)
- Rocket Propelled Grenades
- Shotgun
- The bigger rifle...
-